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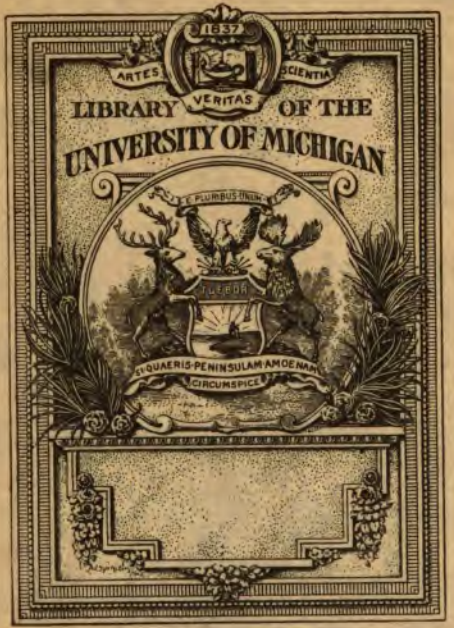
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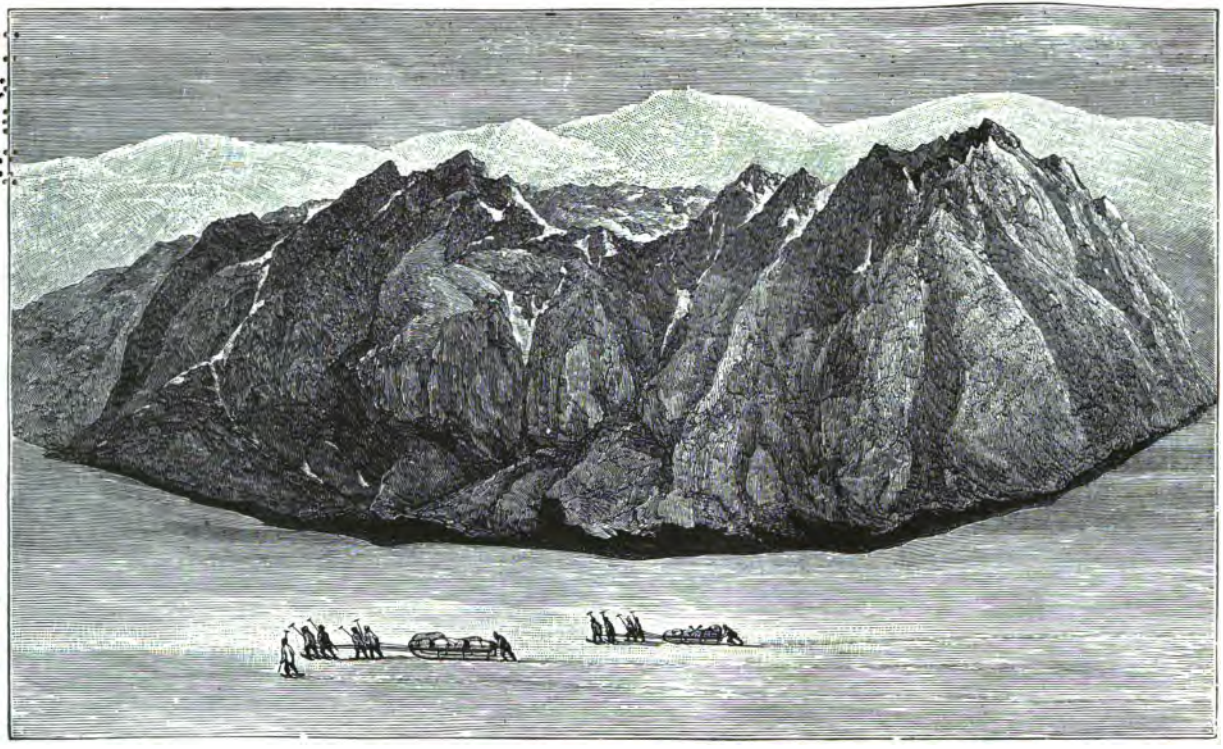

MOUNT PAUL.

Frontispiece.

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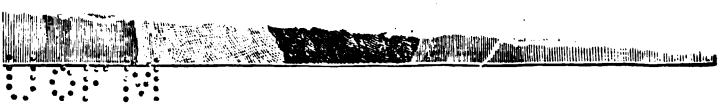

ACROSS THE VATNA JÖKULL;

OR,

Scenes in Iceland;

BEING A DESCRIPTION OF HITHERTO UNKNOWN REGIONS.

BY

WILLIAM LORD WATTS.

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THIS WORK

IS

DEDICATED TO HIS ICELANDIC FRIENDS

BY

W. L. WATTS.

PREFACE.

HAVING traversed several parts of Iceland concerning which nothing has hitherto been known, I have ventured to publish the few following pages, giving an account of my journey across the Vatna Jökull, and my visit to the volcanoes in the North of Iceland.

W. L. W.

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ERRATA.

Page 11, line 16, *for* A.M., *read* P.M.
„ 26, lines 1 and 5, *for* zoolites, *read* zeolites.
„ 27, line 2, *omit* comma *after* Paul.
„ 29, „ 26, *for* 12 A.M., *read* midday.
„ 30, „ 14, *for* laid, *read* lay.
„ 35, „ 12, *after* Fahrenheit, *omit* of frost.
„ 58, „ 18, *for* laid, *read* lay.
„ 100, „ 22, *for* meat, *read* feet.

ACROSS THE VATNA JÖKULL.

ICELAND again! Reykjavík again! Here I am upon the same errand as in 1871 and 1874—foolhardiness and folly as it is denounced by some at home. I fancy I can see some of my worthy countrymen at ten o'clock in the morning, clad in dressing-gown and slippers, breakfast half finished, and a copy of some journal that has condescended to take notice of my little expedition in his hand. Umph! he says, 5,000 square miles of uninhabited country, a howling wilderness, nothing but volcanoes, ice, and snow —a man must be a fool to want to go there; no one ever has crossed this cold, desolate region, why, in the name of everything that is worth pounds, shillings, and pence, should any one be mad enough to want to do so now? It would be in vain to refer him to that element in the Anglo-Saxon, which especially longs to associate itself with the unknown; he scouts the idea of possible scientific results; no pulse would quicken in his frame because he stood where no mortal had planted his foot before. He sees it costs money, time, and labour. He thinks of the hard

cash going out that might be advantageously invested (and rightly so, too, if he enjoys the felicity of being a paterfamilias); he magnifies the risk a thousandfold, and stamps the whole concern as "utter folly." Well! well! let our worthy friend stop at home; it is his element. Only it would be as well if he did not go out of his way to anathematise an expedition which costs him not a farthing, which occupies not one moment of his time, and risks not a hair of his head. Everyone, it is said, is mad upon some point or another. Our worthy friend's mania may be, that he thinks he is specially called upon to spend his energies in breeding a superior race of poultry; mine may be to wander amongst unknown or unfrequented corners of the earth; but so long as I leave his chicken-house unmolested, I think he should leave off sneering at my wild peregrinations. But a truce to critical stay-at-homes, for we are again upon our travels.

We have endured the unstable liveliness of the old steam-ship "Diana," and have reached the little capital of Iceland again, to find most of our friends alive and well, and Paul Paulsen (whom the readers of "Snioland" will recognise as my head man upon the Vatna Jökull last year), who greets us with the cheering intelligence that our horses have been all provided, that our complement of men has been

already hired, and that as soon as I have paid a few complimentary visits to my friends in Reykjavík, he is ready to raise the shout of, "Forwārd to the snows of Vatna Jökull!"

Twelve hours are sufficient to effect my friendly purposes, and the evening after that upon which we landed a small boat full of boxes, saddles, and the necessary equipments for our long journey was lying alongside one of the little wooden landing-stages in front of the town. It was 8 P.M. before we made our appearance, escorted by a numerous party of Icelandic friends. As many as could do so, without inconvenience to the rowers, squeezed themselves into the little boat, and we departed amid the cheers of our friends and, I believe, the good wishes of all the inhabitants. Clear of the shore, we hoisted our sail and glided along at no inconsiderable pace towards the little farm of Laugarnes, at the east end of the bay, where our horses were awaiting us, while we enlivened our brief voyage by a Norse song or two, accompanied by an intermittent fantasia by friend Oddr Gíslason upon the French horn. We found our horses in as fair a condition as was possible for the time of year; but it saves an immense deal of trouble and some money if one knows of any person to be relied on, who can be entrusted with a commission to purchase horses previous to one's arrival,

for we thus avoid not merely the harassing delay incidental to procuring these important necessaries for Icelandic travel, but the payment of a long price for the sorry animals which generally fall to the lot of the tourist, who must purchase a stud as soon as he has landed in the island. My horses had been procured from the south of Iceland; they cost from fifty to ninety dollars each, and were, upon the whole, I think, the finest set of horses I had ever seen in the country.

As I intended to travel as fast as I could to the seat of our summer's work, I had a change of horses for riding and for the pack-boxes. This is absolutely necessary where anything like hard riding is contemplated, but it is by no means essential where time is not an object. After some delay incidental to reducing the baggage to a portable shape and proportion, which is always a matter of some difficulty at the commencement of either an equestrian or pedestrian journey, we took leave of the remainder of our friends, and accompanied by Paul and another Icelander, we pursued our way eastward, over the roughest path imaginable, towards Eyrarbakki, amid the gathering gloom of what turned out to be a wet and miserable day. It is always necessary to take an extra man to help during the first day's journey, for the horses are always more unruly and

obstinate the first day or two. This is especially the case where the route is a rough one, like that towards Eyrarbakki. The first part of our course lay over a series of ancient lava streams, upon which the scant herbage was being cropped by a few miserable sheep which had escaped the hand of the shearer; their dirty, ragged coats had been partly torn from their backs by the crags among which they had scrambled, giving them a deplorable appearance quite in keeping with the forbidding aspect of the country and the miserable day. About midday we reached the wretched little farm of Lœkjarbotn. It boasted nothing but squalor, stock-fish, and dirty children. I do not know why it is, but most of the farms in the immediate neighbourhood of Reykjavík are of the poorest and most wretched description. It is true their pastures in most cases are poorer than those of other parts of the country, but there is a great difference in the people also. No one can help noticing a settled look of contented despair in their countenance, scarcely to be wondered at considering their surroundings, which, in this particular instance, seemed as much like hopeless wretchedness as anything I had ever seen. Ah, well! our horses are rested, we have waded through the slush pools and the mire which front that heterogeneous mound of lava blocks, turf, and timber, which we can scarcely

conceive anyone, by any stretch of sentimental imagination, calling *home*. Our horses struggled down the steep mound of slippery mud which by no means assists travellers either to arrive at or depart from Lœkjarbotn. Leaving this little patch of stagnant misery behind us, we come upon the desolate lava, the dank mists from the adjacent mountains wrapping themselves around us, a driving rain beating into our faces, and a nipping wind exaggerating our discomfort, and assisting the rain to find out the weak places in our mackintosh armour.

We next ascended the hills of Hengilsfjall. This volcano (Hengill) and its neighbours have given vent to numerous pre-historic eruptions, from which vast streams of lava have issued in various directions, not only having poured from the craters of the mountains themselves, but having welled up at various places in huge mamelonic forms. Near the summit of the mountains is a boiling spring, the medicinal properties of which are thought very highly of by the well-known Dr. Hjaltalín, of Reykjavík. In fine weather this part of the country must be very interesting, and even Lœkjarbotn itself might not have looked so extra melancholy. In journeying through these centres of volcanic activity we cannot but be struck with the general lowness of the volcanoes in Iceland. This is doubtless owing to the number of

vents which exist in close proximity to one another, so that the volcanic force, having piled up a certain amount of superincumbent matter, finds readier exit by bursting through the superficial overlying rocks in adjacent localities, which offered less resistance than the accumulated volcanic products which they themselves had previously erupted, or by availing themselves of some pre-existing point of disturbance which afforded them a readier escape. The evening found us at the small farm of Hraun, which impressed me more favourably than Lœkjarbotn, although it was kept by a poor widow whose means were excessively limited.

Not having burdened myself with more provisions than I required for the Vatna Jökull alone, we were here again dependent upon the resources of the country, and although this is the worst time of year to travel without provisions in Iceland, still we fared not amiss, obtaining a sufficiency of rye cake, milk, and smoked mutton, which, without being very palatable, answered all the purpose of affording us a meal. Although we had employed a lad to watch our horses during the night, some of them were found astray in the morning. When travelling in this country, especially in the earlier part of the journey, it is by far the best to hire some one to watch the horses, rather than to hobble them while

grazing, for, in the first place, even when hobbled, horses will stray a long way, and, very often, the only effect of hobbling is to prevent their picking out the best of the pasture, and one finds in the morning they have decamped just the same as if they had been turned out loose.

Having again got under weigh, we were soon upon the sandy shores of the Ölfusá. This river is formed by the confluent waters of the Hvitá and the Sog, which unite, some twenty English miles from the point where they flow into the sea, forming a very large body of water. Here several seals were basking in the sun, and lying like pieces of rock within a hundred yards of our track, but upon our nearer approach they scrambled into the water with considerable agility. Eyrarbakki really means sandy bank; it is situated upon the east side of the Ölfusá, at the point where that river empties itself into the sea. Upon both sides of the Ölfusá, and on the west side in particular, are great stretches of black sand, while upon the west side these are grown over with wild oats, and the more one looks on the vast accumulation on the west of the river, the more one is struck with its magnitude. Its cause, however, is apparent.

At this point, huge lava streams, flowing down from the volcanoes upon the west side of the river, have obstructed the mud and sand brought down by

the waters of that stream; where an immense bed of sand was formed, which diverted the course of the river, causing it to empty itself further to the east, leaving these huge accumulations of sand high and dry on the western side.

Having crossed the stream by means of a ferry, we found that the irons of all our pack-boxes required alteration, and we could not halt at a better place than Eyrarbakki to have them attended to. These irons, which attach the pack-box to the pack-saddle, are the nightmare of Icelandic travel; and travellers cannot be too particular in having them of the most careful construction, also of the best material possible; again, if anything be amiss with them, they should be always attended to at the earliest opportunity, or a breakdown is sure to occur in some inconvenient or outlandish place; and, but for the Icelanders' remarkable faculty for improvising ways and means, such occasions would cause a serious delay in a day's march. Eyrarbakki is one of the principal trading stations in the south of Iceland. It is situated upon a dreary sandbank, the view from which is most monotonous and depressing, while the wailing roar of the formidable breakers, which here extend a long distance out to sea, is melancholy in the extreme.

All along this portion of the shore, ancient lava

streams have run out into the sea; but upon the land they are indiscernible, owing to the alluvium with which they are covered. The whole of the south coast, from Eyrarbakki to Papós, is rendered inaccessible to ships by shoals, sand-banks, and sunken rocks, and there is not an inlet during all that distance of some 200 miles which a ship could enter.

Having ridden within a few miles of the River Thjórsá, although it was the middle of the night, we stopped at a farm to purchase another horse, and, having roused the inmates from their beds, we completed our purchase, took "schnapps," and rode away to the Thjórsá. It was past 1 A.M., and the ferryman had gone to bed on the opposite side of the river; it was raining, sleeting, and blowing hard; again and again we shouted, but the storm and the roaring of the water proved too much even for our united lungs, which were none of the weakest. Fortunately, Paul remembered there was a farmer who owned a boat a mile or so further up the side of the river we were on, he therefore roused him while I looked after the horses. This was scarcely an easy task, for, in spite of the driving storm, they strayed away to graze in every direction. Bye-and-bye the farmer and his wife made their appearance. They seemed quite happy at being disturbed from their warm beds in the middle of a cold, stormy

night, to earn a dollar-and-a-half by paddling about in the icy cold water of the Thjórsá and ferrying over their nocturnal visitors with their goods and chattels. In fact, our worthy charon seemed to look upon it as a piece of good fortune. *At this time of the year, it is light all night.*

The weather cleared about 8 A.M. and we had a good view of Mount Hekla as we forded the West Rángá. We stopped between the rivers East and West Rángá, where we had to pay for one of the horses we were riding, for Paul had only brought it with him to Reykjavík on sale or return. Here we took coffee, and next proceeded to Breiða-bólstaðr, where, as usual, we were received with great kindness and hospitality. After taking two hours' sleep, we pushed on to Holt, which we reached about 1 A.M. The day was half spent before we were again on our way; so we rode briskly to Skógarfoss, one of the largest and most beautiful waterfalls in Iceland, where there is a very good farm, and the people are extremely thrifty. I suppose they had never been able to procure any of the legendary gold beneath the falls of Skógarfoss, but they evidently manage to screw a tolerable amount out of travellers who come to admire its beauties.

On, on; past the ice cliffs of Eyjafjalla Jökull to Heiði, where we were so kindly entertained last

year. It was 10 P.M. when eight horses, which showed as though they wanted to graze, and two men, who looked as if they wanted to go to bed, drew up in front of this hospitable dwelling.

The farm is a poor one, though the good folks make the best of it. Their lives, like that of all the poorer Icelanders, must be one continuous struggle against poverty, inclement weather, and a fruitless soil. Yet they have a few sheep and cows upon the hillside; plenty of fish in the lake; and withal are contented. But their contentment is evidently of a very different kind to that which we noticed at Lœkjarbotn; it manifestly results from a hope that their circumstances may be improved by domestic thrift, and good fortune with their flocks. Hopeful contentment differs from the contentment of despair in this respect, the one is cheerful and open to improvement, the other is sullen and so sunken in the slough of despondency as to have given up all hope of a change for the better, and thus to be incapable of availing itself of any propitious opportunity, if such should occur. One day's rest at Heiði, and we mount again, directing our course eastward; riding swiftly over the arid waste of Myrdals Sandr, we reached the banks of the river Kuða-fljót. We find that this river, which we forded with considerable difficulty last year, could now only be crossed in

boats. This shows how the unstable beds of Icelandic rivers shift and change about, transforming shallows into deep water, and creating sand-banks amid the deepest river channels.

We purchased of our ferryman some birds (skümur) which were considered very good to eat. We stopped for the night at the farm of Króki. The farmer, who had been previously hired to form one of my expedition across the Vatna Jökull, regaled us with swan's flesh, which much resembled tough beef; and, although eating it was rather hard work, it was certainly nutritious and palatable. The farmer, Olgi by name, had taken up shooting as his special hobby, and, in spite of his inefficient tools, a very profitable use he appeared to make of it, if we might judge from the numerous swan-skins which were drying outside his house, and the amount of swan's flesh that was being salted. The swans of Iceland are valuable on account of their down; the outer feathers are seldom of any good; for they are never pure white; the value of a swan skin is about one rix dollar, Danish. After a ramble amongst the lava which had flowed from the Skaptar Jökull during the remarkable eruption of 1783, we resumed our journey; the day was very hot—as much so as any July day in England. Passing the beautiful waterfall of Seljalandsfoss, which appeared in the

bright sunlight like curtains of silvery foam upon the face of the dark basaltic cliffs, which here are about 200 feet in height, we arrived at the farm of Hörgsdalr. Here dwelt another of our "Jökull men" (as Paul called those he had hired for my expedition) named Eyólfr; he was one of the toughest, blithest-hearted, and most good-natured fellows I had ever come across.

The bóndi (as the Icelandic farmer is called) was a relation of the farmer at Núpstað, whose farm, where I had received such kindly welcome in 1871 and 1874, was only half-a-day's journey eastward.

I found the farmer of Hörgsdalr, like his relative, extremely hospitable; taking a great interest in my expedition, and willing to give every assistance in his power.

The next day we ascended the Kaldbakkr, a mountain 2279 feet in height, in order to get a good look at the south side of the Vatna Jökull, which was directly to the north of it. Kaldbakkr is situated a few miles to the north of Hörgsdalr.

Accompanied by the farmer, we rode to the last patch of grass that was nearest the mountain, and, after a smart scramble, reached the summit. The Jökull looked decidedly whiter than I had ever seen it, but there was the same expanse of snow losing itself in the northern distance; pure, silent, dazzling,

beautiful, and spotless, save where a few black peaks and uncouth masses of dark rock protruded through the frozen covering. These were scattered at long intervals across the unsullied snow-slopes, and clustered together in the south-west, where lies that portion of the Vatna known as the Skaptar Jökull. Harmless and guileless they looked in the morning sunshine; but they had vomited the lava which had desolated the plain below, and had given vent to the fiery force which from time to time had shaken Iceland to its very foundations! One peak to the north-west especially attracted my attention, on account of its height and its perfectly conical form, and my guide informed me that it had erupted on several occasions, and that the last outburst occurred about thirty years ago.

It was with no small satisfaction I arrived at the now familiar homestead of Núpstað, and received the usual glad welcome from the bóndi Ayólver, who had been expecting us. I again took up my quarters in the disused little church, which makes such a good storehouse for my friend Ayólver, and such an excellent resting-place for chance travellers like myself. It seemed quite home-like as I tumbled into the little bed which had been improvised upon the boxes in the corner, and I experienced the comfortable feeling of being in my old place again as

I ate my breakfast off and posted up my diary upon the antiquated communion table. Do not be shocked, good reader! all sanctity had long ago departed from this useful piece of furniture, and if we were to peep into the inside, we should find neither sacred utensils nor vestments; but simply the serviceable homespun garments of the bondi's wife.

The farm and the rocks behind it were but little altered since I first saw them four years ago. One year in Núpstaðr is much like its predecessor, and things go on, year after year, in just the same routine, except where the inevitable changes of life and death intervene. The people had altered the most, for of course they had grown older, and one or two faces were missing! Well, I have grown older, too—it is no good to stand dreaming. There is a bullock to be bought, butchered, and salted, preparatory to making it into "kœfar," as the Icelanders call the kind of pemmican I make for my Jökull expeditions. Skin-bags and mocassins have to be procured; butter, bread, and stock-fish have to be sought after; in fact, the greater part of three weeks' provisions for six men must be collected from the neighbouring farms. We made the necessary arrangements, and settled that these various articles are to be ready for us in a week's time; we then deputed Paul's father to attend to the levying of our requisitions,

and the payment for them. The ox was next slain, dissected, and salted, and we were again ready to start on our travels.

Some little difficulty was experienced in getting all into train, owing to the hurry all the farmers of this locality were in to get this year's wool to the store at Papós, which is situated four days' journey to the east; for tidings had been received that the ice of a portion of the Vatna Jökull, known as the Breiðamerkr had advanced to such an extent as to threaten the cutting off of all communication along the sea-shore, since the advance still continued. In consequence of this alarm every farmer was busy preparing the wool for market; steaming cauldrons were cleansing it from its grease, bands of sturdy Icelandic maidens were rinsing it in the clear water of the mountain streams—which are almost sure to be found in close proximity to the farms in this part of the country—patches of white wool were drying upon the ground, while the male part of the community were measuring it in quaint wooden baskets, packing it into sacks, and forming bundles of equal weight to balance on each side of the pack-horses. It would be a very serious thing, indeed, if the road to Papós were to be intercepted, as it would compel the dwellers in this district to journey to Eyrarbakki before they could exchange their produce for the

necessaries they require. Leaving Nupstað behind us, we set out for the advancing glacier, and turned our faces towards the snowy slopes of Örœfa.

The Súla river, or Núpsvatn, had to be crossed. It was deeper than I had before seen it, though its volume of water scarcely seemed to have increased. Its bed was changed to one of pebbles and quicksand. In 1871 it was of pebbles only, in 1874 it was black sand, in 1875 it is again pebbles and sand.

We crossed the river and fast sped on our way over the desert of Skeiðarár Sandr. This sand occupies an area of 300 square miles. It has been formed by the joint efforts of volcanoes upon the Vatna and Mount Örœfa, which have strewn this tract with sand and ashes, and whose ejectamenta have been brought down by the shifting waters of numerous glacial streams which traverse the Skeiðarár Sandr in many directions. It would seem that the portion of the Vatna which here bounds the Skeiðarár Sandr upon the north has acted in a similar manner to the Breiðamerkr Jökull; for numerous *moraines* occur upon these sands, some of which are at a great distance from the utmost limit of the Jökull at the present time. Indeed, there has been an obvious advance at this point since 1871 of the fringe of the glacier which almost surrounds the

Vatna Jökull. The existence of scratched rocks in *moraines* in Iceland below the limit of the glaciers does not of necessity prove that such glaciers have bodily advanced, as during extensive eruptions of glacial mountains huge masses of ice frequently slip forward to considerable distances, scratching the harder and furrowing the softer rocks in their progress, which, upon their melting, leave large piles of glacial *débris*, in no way distinguishable from a *moraine* stranded upon the lower elevations.

It was blowing hard from the east with heavy rain, but upon the west side of the mountain before us (Örœfa) the sun was shining in the most tantalising manner, so that as we urged our horses along the heavy sands we were fain to fancy ourselves exploring those dazzling glaciers and snowy slopes which seemed to fascinate the sunshine and detain it from reaching us.

We were soon under the lee of the mountains before us. Sheltered from the wind and the storm, we could stop to admire the grand sweep from the Örœfa to the commencement of the Skeiðará Jökull. Looking back at Nupstað, we saw it enwrapped in gloom, the clouds clustering round the Lómagnúpar,[1] a mountain which seems to attract all the

[1] So called from a particular kind of bird, called Lómi, which frequents this mountain.

bad weather to Núpstað; and the storm sat heavily upon the western portion of the plain of Skeiðarár Sandr, which was exposed to the fury of the east winds.

Crossing the river Skeiðará, we reached the Saga-famed Svínafell. Here we stayed to refresh ourselves with the national panacea for the ills of Icelandic travel, namely, a cup of coffee of the real Icelandic brew! The art of making good coffee is one of the greatest accomplishments of the fair sex here, and it is a pity it is not more generally attained by the lady population of other countries. The occurrence of drinkable coffee in Iceland, a good cup of it being always to be obtained at the poorest farm, is the more remarkable, as the coffee sold by the merchants at the various stores is never of the best quality; but is principally the Java coffee. The grand secret of success in this special domestic art is doubtless owing to the fact that the coffee is roasted at home, exactly to the right turn, and deftly manipulated in some particular way which early training and long practice can alone effect. The last and by no means the least adjunct to this national *bonne bouche* is in most cases a good supply of cream.

Being thus fortified, we were taken to see a birch-tree upon the hill behind the farm. This tree might

have been five-and-twenty feet in height, and it was considered the largest tree in this part of the island. There is, however, a considerable growth of bushy trees, principally birch, in the valley called Núpstaða skógr, down which the river Súla flows. It is by far the largest wood in the south of Iceland. Núpstaða-skógr is likewise remarkable for containing a breed of wild sheep, which belongs to our friend Ayólver, who is the owner of the skógar, together with the valuable farm of Núpstað. There is also another patch of wood at the north-west base of Örœfa, which is of great use to Svínafell and the adjacent farms.

The hills behind Svínafell are basaltic; but as we proceeded further eastward, we soon found ourselves surrounded by the more recent products of the volcano Örœfa, which towered above us upon our left hand. Seeing a party of horsemen approaching, we whipped our little drove together, and met them upon the grass which was a few hundred yards off.

The party consisted of an Althing's-man, who was going to Reykjavík to attend the Althing, or Icelandic Parliament, with his servants, and the priest from Sandfell, at whose house he had been staying, and who was escorting him for a short distance. The priest turned out to be a cousin of my man Paul, so after a brief colloquy, and requesting the Althing's-

man to convey our greetings to friends at Reykjavík, we rode on to Sandfell.

Our road lay past several beds of white pumice which had all been ejected from Öræfa. A smart gallop over cinders and fragments of lava brought us to the church and parsonage. Sandfell is situated at the south base of Öræfa. Behind it rise barren hills of compact agglomerate, composed of volcanic ash and fragments of lava, but our friend the priest is compensated for his dreary surroundings by having one of the prettiest Icelandic women I have seen for his wife. She seemed quite piqued because I could not own to thinking Sandfell a very pretty place. Going hence, we crossed the stream of lava and agglomerate, which I was informed resulted from the eruption of Öræfa in 1862. This stream is a remarkable one, inasmuch as the agglomerate has flowed down in a semi-molten state, cotemporaneously with the lava, both being mixed together; the agglomerate appears to preponderate, but this may be the result of the lava being of higher specific gravity, which causes it to sink to the bottom of the stream.

We stopped for the night at Myrum,[1] on the south-west of the Breiðamerkr Sandr. The bóndi, like all the people of this district, was hastening to get to Papós with his wool. We supped and breakfasted off some

[1] Not marked on the map.

birds which our host called Svartfugl. They were the nicest birds I had ever tasted in Iceland, the meat being tender and plenty of it, and I thought so well of this dish that I took one of the birds away with us for our lunch on the road.

Here we hired a fresh horse, leaving Paul's, which had contracted a sore back, and started over the Breiðamerkr Sandr. The sands, like the Skeiðarár Sandr are the result of the great efforts of the Öræfa and Vatna Jökulls, more especially the part of the Vatna known as the Breiðamerkr Jökull, which was the one whose movements we had to examine.

The road over these sands is long and dreary, especially in such weather as had just overtaken us. We passed an extensive encampment of farmers, who were on their way to Papós; but, despairing of crossing the rivers which traverse the Breiðamerkr Sandr upon such a day with heavily laden horses, they had decided on remaining encamped upon the little patch of grass they had reached. About one third of the way over the Sandr we arrived at the farm of Kvísker, which is situated upon a little oasis of grass-land. We found it a very acceptable halting-place, and although we were wet, we were glad to sit down and take coffee and schnapps, and smoke a pipe inside; the room had no windows, and it was

filled with planks and carpenter's tools, for the house was being enlarged. We could obtain but little food for our horses, and the greater part of our day's work had yet to be accomplished; so a quarter of an hour saw us again to horse, and rapidly approaching the extreme point of the advancing Jökull. This Jökull appeared unlike most of the Icelandic glaciers I have seen. Instead of terminating in an even slope, or steep rounded cliffs of ice, sometimes fissured, but generally very regular, it terminated in an irregular wall of cloven and contorted masses of the rifled and dislocated glaciers; while the more elevated masses assumed the form of spires, towers and grotesque architectural shapes. As we were intently looking at them, some of them tottered and fell. It is indeed a serious matter to contemplate the short distance now left between the Jökull and the sea—at one point not more than 250 yards—in addition to this, new rivers have been formed between the Jökull and the sea, which have to be crossed, but which it would be impossible to do with a strong south wind blowing. The Jökulsá is quite bad enough, but to have several miles of road converted into quicksand by the diverted waters of the Jökulsá, and to have new rivers in addition to the advance of the Jökull, is enough to make the people of the district fear for the road to Papós. One consolation may exist—that the Jökull

has advanced before, and, after a considerable time, retreated. Still, as an old inhabitant of the neighbourhood informed me, "It never has advanced as it does now," and even upon the other occasion, upon the whole, it gained ground. Alas! poor Iceland—both fire and water appear allied against it; the latter especially, in all its forms—boiling, cold, and frozen, and in the form of rain, hail, snow, and vapour! We were obliged at one point to travel along the sea-shore, where we espied the body of a large fish with some dark objects moving about it. A nearer approach showed it to be a small whale, which, from olfactory evidence, had lain there for some time. The dark objects, startled at our appearance, rose in a covey of —well, the same birds of which we had enjoyed the flavour at Myrum. Svartfugl have never tasted quite so nice to me since. At last the Breiðamerkr Sandr were passed; fresh mountains rose before us, and the weather cleared. To our right was a remarkable lagoon, Breiða-bólstaðalón; which is a narrow fjord, twelve miles in length, enclosed upon the south by a large sand-bank running parallel with the shore. This lagoon is open to the sea at the north-east end, but is too shallow for ships to enter.

Evening found us at Kálfafellstaðr, a place pleasantly situated beneath the outlying hills of the Vatna Jökull. These hills are principally composed

of amygdaloidal basalt, abounding in zoolites; chalcedonies are especially plentiful, and I dare say it might pay to look for the precious opal. This eastern corner of Iceland appears to be particularly rich in zoolites; I noticed the same when I was at Berufjörðr.

We stayed for the night with another relative of Paul—he seemed to have kindred nearly all over the island, and a very superior race they appear to be. This relation was the widow of the former priest of Kálfafellstaðr. Here we bought another horse, and hired the widow's son, a lad about seventeen; for we required a man and a lad to drive our horses round to the north of the island while we crossed the Vatna Jökull. The widow and her daughter accompanied us a short distance upon our return journey, and, after two days' riding, we were again at Núpstað.

Preparations for our journey across the Vatna now commenced in earnest. The sleighs and the snow-shoes had been made according to our instructions. All was there except the men and the butter; enough of the latter, however, turned up in the morning to enable us to make the pemmican, which I at once set myself to work to superintend.

A fire was lighted and a cauldron of water soon heated, and the beef boiled; then came the work of

cutting up an entire ox into pieces the size of ordinary wine-corks. Paul, senior, and I commenced operations by first taking out the bones; and, by dint of sharp knives, and a few hours' hard work, we prepared about seventy-eight pounds of meat. Twenty pounds of salt butter and half-a-pound of salt were then melted in the cauldron, and the meat carefully mixed with it. After a short time it was ready to be packed in the skin bags in which it was to be carried.

The bags were placed in troughs of water during the operation of filling, to prevent leakage at the seams, and when they were filled they were tied up and laid in a stream close by, where stones were piled upon them to press down the meat. When they were sufficiently pressed, and the contents had become cold (which took about twenty hours), they were each placed in ordinary sacks for more easy carriage; for greasy skin-bags full of meat are rather slippery things to carry, and somewhat nasty things to handle.

By June 25th all my preparations were made, and my men arrived; Paul Paulsen and a cousin of his from Skaptarfellssysla; Helgi, from the farm of Króki; Finnur, from Myrdalssysla; and Eyólfr, from Hörgsdalr: these were to accompany me across the Vatna Jökull. In addition were Bjarni, who was with

me last year; the farmer from Rauðberg, who carried the post between Prestbakki and Berufjörðr—a deaf and dumb man, and a man named Vigfúss; these four were to return when we reached the mountain which I last year named "Mount Paul," about a third of the way across the Jökull. I had also arranged with Paul's father and little Arni, whom I had hired at Kálfafellstaðr, to take our horses from Núpstað round the east side of the Vatna into the north of the island.

Our equipment, which was to be drawn upon hand-sleighs, consisted of a low tent, four feet high; a large sleeping-bag, which would accomodate six of us—this was eight feet long, and five feet wide—one side being made of a layer of cork and felt, covered with mackintosh, and the other of a stout blanket also covered with waterproof. This bag was open at both ends, so that three could sleep with their heads one way and three with their heads the other. Both these openings were covered by a hood, which proved a great protection to our heads while sleeping, and prevented the snow from getting into the bag. This gave us sleeping accommodation for six persons, with a weight of only sixty pounds. This bed, however, had its disadvantages; for instance, if any one was taken with cramp, or dreamt of engaging in any particularly active exercise, its

limited dimensions became painfully apparent; moreover, it is almost impossible to keep the inside of the bag perfectly dry, owing to the exhalation from our bodies. I have paid great attention to this matter, but have found that for a prolonged sojourn amidst wet snow, where weight is a subject of paramount importance, it is the best sleeping arrangement that can be contrived.

Our provisions consisted of 100 lbs. of pemmican in skin bags, 50 lbs. of butter, 100 lbs. of skonrok, or Danish ship-biscuits, 15 lbs. of dried fish, 15 lbs. of dried mutton, 12 lbs. of gravy soup, 2 tins of "soupe Julienne," in packets; 6 tins of chocolate and milk, 2 lbs. of cocoa, and 4 lbs. of sugar; 2 gallons of proof whiskey, 1 gallon of spirit for burning, 5 lbs. of tobacco, and 3 tins of Peek and Frean's meat biscuits. I had a small Russian furnace, which is an excellent lamp for heating water or melting snow. These articles, with a good supply of warm clothing, waterproofs, and mocassins (for it is impossible to wear leather boots in the snow), and the necessary instruments and implements, completed our outfit.

All things were now ready, and the day had at length arrived when we were to assail the Vatna again. We rose betimes, but it was 12 A.M. before we were fairly on our way. I took leave of the

bondi Ayólver, who would not charge me anything for my own board and for the keep of my own horses. He was too unwell to accompany us to the Vatna, and seemed quite upset at saying good-bye, as he said he felt sure it would be for the last time, whether we got across the Jökull or not. I cheered him up, and said, I hoped some day or another to come to Núpstaðr again; and so we started on horseback, and, after crossing the river Diúpá, we commenced the ascent of Kálfafellsfjall, which hill lay between us and the Vatna.

The journey was a very trying one to the horses; it is so at the best of times, but now the melting snow still laid thickly, and in places had converted the unstable soil into quicksands. In some parts it was necessary to cross ravines full of snow, which had melted underneath, leaving the bottom of the ravine roofed. The horses fought very shy of these snow-roofed valleys, and when we came to any hole which had been formed by the subsidence of a portion of the snow into the valley beneath, it was with difficulty we could get them along, as the noise of the stream, which invariably ran below, made them rather fractious. But the snow having regelated into an indurated compact mass, was often some yards in thickness, so I do not think there was any real danger of sinking through

it. These preliminary difficulties were soon disposed of, and 6 P.M. found us at that point where the rocks terminate and the eternal snows of the Vatna commence.

A squall of sleet and wind now rolled down upon us. I immediately directed two men to prepare some coffee, for we had brought wood for that purpose, while some gave the horses a feed of hay, and others unpacked the burdens they had carried so pluckily from Núpstaðr. The coffee was soon ready, the storm cleared, and the scene must have bordered on the picturesque, or perhaps the "*unique*," as we all clustered round the remnant of the fire, amid the different packages that were to cross the Vatna, our horses pawing the ground, impatient to return to their pastures. The grand white Jökull lay before us, the black crags of the fjalls behind us, and the roar of the Diúpá in our ears, while a beautiful rainbow spanned the eastern sky—a harbinger, we trusted, of good success.

Here we took leave of Paul's father and his cousin Arni, directing them where to wait for us with the horses, in the north of the island. The evening promised to be showery; but having a lively reminiscence of the black sand of this locality, which at our last year's encampment upon this spot got into our ears, our eyes, and our food, I determined to

advance and camp, as soon as we needed to do so, upon the deep snow, although my men had already begun to put up a temporary abode with loose stones from the terminal *moraine* of the Jökull.

At this point last year the Jökull was a crevassed glacier, whose surface was covered with aiguilles and hummocks of black sand and ice. But all traces of the glacier were buried beneath a vast accumulation of snow! From the first we were able to use our sleighs, and, turning due northward, we left the habitable world behind us, being face to face with the hardest piece of our summer work. As far as the eye could see was one lifeless, pathless wilderness of snow, destitute alike of animal, insect, or floral life. Our footsteps gave no sound, and our very voices seemed strange in this drear solitude, the death-like stillness of whose snowy wastes is broken only by the howling of the storm, or the outburst of a volcano! It was evident that a much greater snowfall had taken place during the past winter than in the preceding one, and the newly-fallen snow took us up to our knees, making our progress very difficult and slow. After about three hours' dragging, it began to snow, and a thick fog enveloped us, so I decided to encamp. The plan I usually adopt for sleeping in the snow—and I believe one of the warmest and best methods—is to dig a square hole, three or four

feet deep; over this I pitch my tent, banking it well round the sides with snow. I then spread the sleeping bag at the bottom of the hole, with the hoods doubled down over the ends to prevent any snow getting into it. If a storm is blowing, I cast up a bank of snow to windward, and take everything that will be required for immediate use into the tent. The next thing is to draw the sleighs up to the door of the tent; so that if anything extra is required it can be procured without much difficulty, and having stuck up all sticks and shovels firmly in the snow, to prevent their getting covered up and lost, we turn in, changing our wet or snowy clothes sitting upon the waterproof exterior of the bag, and, putting on a dry change, we all get into the bag, having previously fixed up waterproof coats upon the snowy wall at each end, to lean against. If it is not freezing very hard, we hang our snowy clothes upon a line at the top of our tent, with our satchels, &c.; but if it is freezing hard we put them underneath the bed. Snow is then melted, soup or chocolate is made, and rations served, which, with a small allowance of grog, pipes, and a song all round, finish our labours for the day or night, as the case may be, and we go to sleep.

This was the manner in which we now camped, six of us occupying the sleeping-bag, much after the

manner of sardines in a sardine box, the remaining four, who were only to accompany us as far as Mount Paul, made themselves as comfortable as they could with rugs and mackintosh coats in the front part of the tent. I ordered every man to fill his flask with snow and put it in his pocket, that each might have a drink of water when he awoke, and in the course of an hour nothing could be heard but the heavy, stentorian breathing of nine out of ten of our party. Having posted up my diary, I slept well for an hour, when I was awakened by a sudden commotion at the other end of the tent. I called out to Paul for an explanation, saying, "Holloa! what's the matter at your end?" He replied in a deep, solemn voice, "Now is the dumb beating his feet." Although our dumb friend's feet were doubtless cold, I could not allow that method of warming them in a tent only 10 by 6½ feet, and I therefore directed that another man should chafe the dumb man's feet and cuddle them up in his arms. The morning brought us only fog and storm, but after a few hours the latter abated. I served out some warm soup, and we got under weigh. After an hour the fog became so dense, the snow so soft and deep, and a determined sleet had set in, that I was obliged reluctantly to call a halt. Between nine and ten in the evening the weather cleared, the wind shifted to the north-west and the sun came out,

and we again advanced; but the snow being up to our knees, I perceived I was tiring my men. So after going on a few miles I again halted, as it had begun to freeze, and the probability was that in about two hours the snow would be firm enough to travel on. Casting up a bank of snow to windward, we six turned into our bag upon the surface of the snow, leaving the tent and all other wraps for our four extra men.

It was bitterly cold, but the atmosphere was very clear. By 3 A.M. I roused my men; the thermometer registered 20° Fahrenheit of frost; a firm crust had formed upon the snow which bore us bravely. It was a glorious morning and a stiff north wind was blowing; the sleigh travelled merrily along, and as the sun illumined the magnificent snow slopes around us, everything seemed to promise fine weather and success. The pure element we were breathing seemed to give us fresh life and strength, and made us feel equal to the work before us. After three hours one of the men (Vikfúss) gave out, said he could go no further, and lay down upon the snow; but as there were not nearly so many degrees of frost now, the man was warmly clad, and I had a great idea he was shirking, I left him behind, much against the will of his companions. Before we were half a mile away I had the satisfaction of seeing him following,

apparently not very much the worse for wear. The ascent from the first had been a very gradual slope of snow, which now became undulating and somewhat steeper, especially upon the N.E., where steeps of snow swept up to the mountain. I last year named Vatna Jökull "Housie," from the great resemblance which its summit, then free from snow, bore, when viewed in one aspect, to the roof of a house. The likeness was now much less striking, from its being all white.

I can scarcely go on without remarking upon the excellence of the postman from Rauðberg. He was always cheerful, willing and obliging, and had twice the hardihood and strength of the other men. I only regretted I could not take him right across the Vatna, but his postal duties would not admit of so prolonged an absence. We sighted Mount Paul at 9 A.M. Here we made a good breakfast, and our disabled man having slunk up, he made better progress with his meal than he did with his sleigh.

Mount Paul is a cluster of one large and several smaller volcanic eminences, rising to the height of 150 feet above the surrounding snow. A semi-circular pit being thawed out by the radiation of the sun's rays from the south side of the mountain, we found here an abundant supply of water. The mountain is composed of varieties of obsidian,

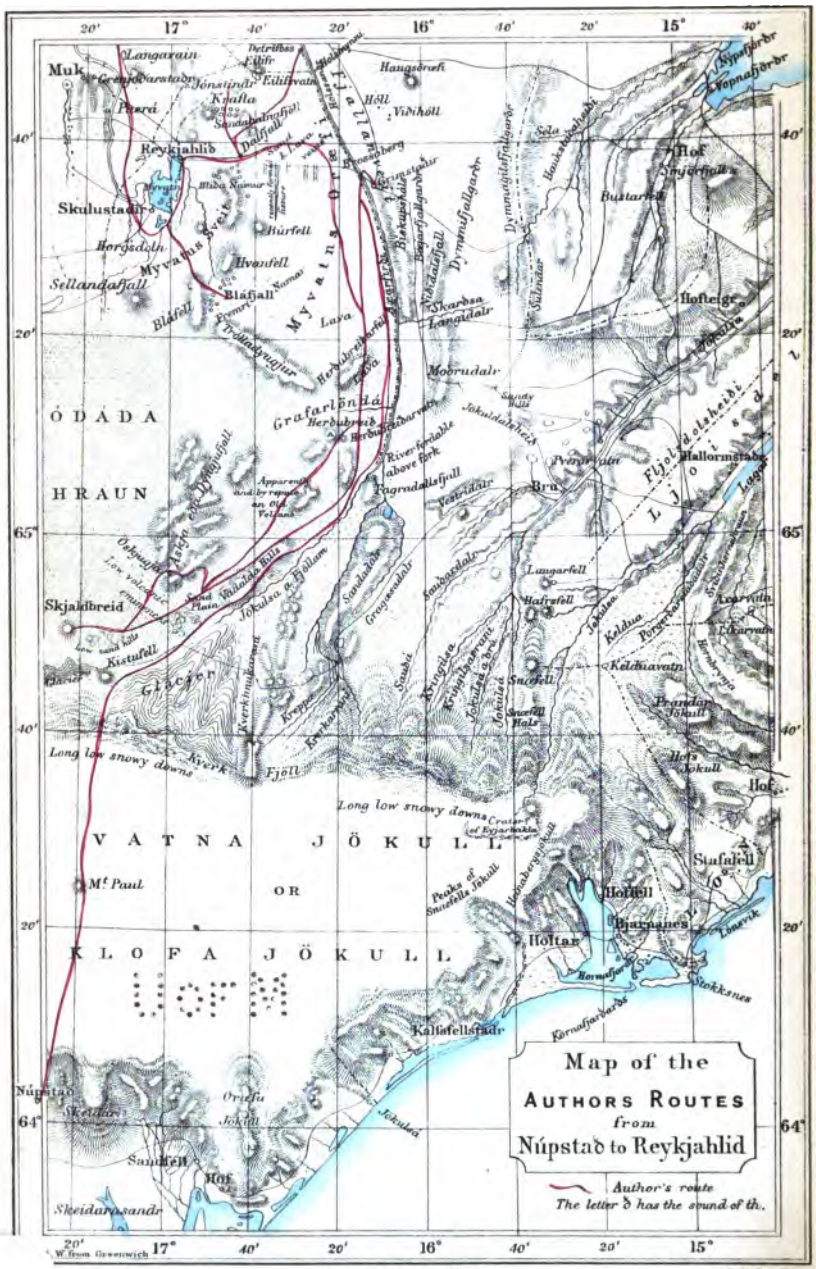
varying from the highly vitreous to the grey stony variety; one portion of it consists of vitreous obsidian cementing together multitudes of the concretionary forms commonly known as spherolites.

We slept for two or three hours; but the state of the snow was such that it was impossible to get the sleighs through it. I sent back my four extra men, for they had little or nothing to carry, and we had left them a good supply of provisions at the commencement of the Jökull. As the accommodation in the tent was but small for them, and it seemed to promise bad weather, they preferred forcing their way back through the soft snow to running the chance of being weather-bound for three or four days. They had not been gone away many hours when it began to rain, and as night drew on it became more and more evident that there would be no frost. The wind had shifted to the S.S.E., the thermometer stood at 33° Fahr., and as the night advanced the snow became so soft and rotten that in some places it took us up over our knees.

The next day the wind was still S.S.E., and the fog and sleet were as bad as ever; and as progress was impossible, I minutely inspected the rocks of Mount Paul. They rise from a large crater now filled with snow. To the south-east is a pit-crater partially filled with snow. Mount Paul is composed almost entirely

soon so surrounded by whirling clouds of snow that it was impossible to distinguish from what quarter the wind was blowing. The compass had for a long time been almost useless, in all probability owing to the magnetic ore contained in the rocks which underlie the snows of the Jökull. This rendered us entirely dependent upon the wind and the sun for our direction. In clear weather, where the compass is useless, I always steer by a circular piece of card marked off into four right angles, so that by carefully taking the angular bearings of all distinguishable objects, one is able to steer a pretty straight course.

Being now unable to avail myself of either compass, sun, wind, or card, nothing remained for us but another halt. For two days the storm continued and it would have been impossible to get many yards away from the tent without being lost. On the third day at noon the storm abated, the wind shifted due east, and the sun broke through the clouds. We all turned out, but it was useless to think of struggling through the loose, deep snow. We took our bed out to dry it, for it was wet with the exhalations from our bodies. This, however, was rather against the wish of some of my men, upon whom the inactivity of the last few days had begun to tell. I observed two black peaks pro-



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truding through the snow, one about five miles due north, and the other about eleven miles N.W. I was surprised to find a considerable quantity of volcanic ash upon the snow, of a fine, light, grey description. This appeared the more remarkable, as I knew of no volcano that had been in eruption south of the Vatna Jökull, and the storm had blown almost entirely from the S.E. Moreover, I was aware there was no ash of that kind anywhere upon the south. It appeared to me that this must have been carried either from an erupting volcano, or from some ash-strewn district to the north of the Jökull, by a current of air travelling in a different direction to the S.S.E. wind which we had experienced during the last few days, and bisecting the latter current at a point south of our present position, had been unable to resist its force, and had been carried by it to the place where it was now lying.

We here obtained an excellent view of the Vatna Jökull Housie, which appeared to be higher than any other point on the Jökull, our present height being 4500 feet—the summit of the Housie being at least 1500 feet above us. Its form is a lop-sided cone, from which I could trace, through my telescope, the course of huge lava streams, now deeply buried in the snow, but still leaving unequal ridges upon each side of the mountain, and in some instances ex-

tending to a considerable distance upon the main body of the Vatna Jökull. An extensive eruption of one of these snow-covered volcanoes must be awful, when any vast volume of lava is suddenly ejected upon such a tremendous accumulation of frozen material; but minor eruptions and smaller streams of lava, I should think, can make but little impression upon such an enormous quantity of snow in the first instance. Probably (unless there has been any great amount of sand or ashes previously ejected) they melt their way through the snow to the rocky bed of the mountain, and forming a sort of tube by the aid of the rapidly consolidated crust upon their surface continue their course, much as a lava stream would upon ordinary ground, or more especially, perhaps, at the bottom of the sea, without occasioning any very remarkable phenomena, and even the effect of the most extensive eruptions must of necessity be but local.

By 4 P.M. the wind shifted back to its old quarter, S.S.E., and, despairing of frost, we again betook ourselves to the tent. Towards midnight, for about the twentieth time, I went out with Paul to look at the weather. We tried the sleighs, and found it was as much as one man could do to pull a sleigh with nothing on it, and a very small weight almost buried the sleigh in the snow, and enabled it to resist our

united efforts to get it along. During our experiment we sunk very deep into the snow. For the last three days I had put every one on half rations, and as anything is better than inactivity with insufficient food, we determined to abandon our sleighs and attempt to force our way through the snow, carrying everything upon our backs. It was rather foggy and sleeting, but the wind was blowing pretty steadily. We communicated our determination to the rest of our party, and they quietly accepted it without a murmur. We packed up everything, and leaving our sleighs and a gathering storm behind us, we turned our faces northward with a cheer which was more animated than might have been expected under the circumstances. I must say our position bore rather a forlorn aspect. Six men heavily laden, wading through snow up to their knees at every step, no view but an ever-advancing circle of gloom, the only variation being that it was darker towards the south, from which quarter a strong wind was blowing, with squalls of sleet and snow. About every quarter of an hour we had to stop from sheer exhaustion, and after two or three hours' arduous toil two of my men became quite incapacitated and too ill to proceed. This was evidently not a case of sham. I therefore halted, and served out with all speed some warm grog; one man was spitting blood,

and another was suffering severe pains in the stomach. I had previously advised every man to wear a cloth bandage round his stomach, but none of them had cared to do so. I suffered rather from pains in the bowels the previous year upon the Vatna Jökull, but I was now wearing an abdominal bandage of tarred cloth, and throughout our prolonged stay upon the snow suffered no inconvenience whatever. The next day was finer, with sunshine and increased cold, with snow at intervals, the thermometer being below freezing point all day; one of the sick men had recovered, but the other was still too ill to travel. Towards evening the wind blew from the west, and it began to freeze hard. I therefore sent back for the sleighs, which we had taken the precaution to stand upright and fix firmly in the snow before we left them.

By 9 P.M. it was freezing very sharply. I served out an allowance of warm grog, and as the invalid was greatly recovered and said he would rather die than go back, we again struck N.N.E., allowing him to go free. We had packed everything on one of the sleighs, four pulling and one pushing behind, and so firm a crust had now formed upon the surface of the snow that this heavily laden sleigh travelled as easily as an empty one would have done the evening before. We now gradually ascended until

at 1 A.M. we reached a rolling plain, at the height of 5750 feet. It was perfectly clear in the west, and I obtained a good view of Tungufell's and Arnarfell's Jökulls, which from the angle they made with our line of march, showed me we were two-thirds of the way across the Vatna Jökull. It was still very thick in the south and east, and the wind had shifted to the south-west. An ice-storm was almost the immediate result, a driving mist encrusting everything with ice; the undulations in the plateau became more and more marked, the variation in altitude being sometimes as much as 100 feet or more. A most obdurate mist continued to prevent our obtaining any further view, which was very exasperating, as we might have passed within a short distance of objects of interest without being conscious of the fact.

We made our first halt at 3 A.M., and took a light meal of Peek and Frean's meat biscuits and snow. When I say snow I do not mean the pure white frosty snow which lies upon the surface, but the coarse, granular, icy particles of which the crust we were walking upon was composed. I have often been dependent upon snow for the water supply, both in North-West America and upon mountains, and I find the coarser the snow is, and the more it approaches the character of ice, the better it quenches

the thirst, and the less likely it is to occasion pain in the stomach. When the fine white snow only can be procured, as every tyro knows, it can be made more palatable by compressing it into a snowball. In other words, the less cold air is swallowed, entangled in the snow, the better; for the very act of squeezing the snow causes it to part with some portion of air, as is shown by the change of colour, as it regelates towards the form of ice. Thus we preferred the coarse icy granules, which formed the crust upon the older snow, to the pure white tempting frost-snow which, owing to the extra amount of air it contained, must have been of a considerably lower temperature than the granulated snow beneath. We were now at the height of 5900 feet, and the temperature was 15° of frost. The rim of the sun was occasionally observable through the fog which surrounded us, giving us a good line to steer by, and bright fog-bows escorted us to windward; but these were simply bows, and had none of the cruciform corona in the interior, which were so observable upon the Myrdal's Jökull last year. At 6 P.M. we reached a steep ascent, where our compass twisted and turned about in the most eccentric fashion; the heavens became black as night to windward, the wind had risen, and was making the peculiar booming noise I have often remarked in these regions before a storm,

and driving a blinding, pitiless drifting snow before it, which eddied about the sleigh and wrapped itself around us, as if longing to enshroud and bury us in its frozen toils. But we had an idea of burying ourselves in our own fashion. "Oskôp mikill stormur kèmur bráðum" (A bad storm is coming on presently), said Eyólfur, sitting down for a moment on the sleigh, and clapping his feet together to knock off the snow which was clinging to his legs, and we were all of the same opinion. We were at the height of 6150 feet, so I ordered a hole to be dug, and the tent to be pitched. The snow was very hard and firm, even at the depth of four feet, and we cut out as clean a hole as if it had been in salt, but the wind drifted so much loose snow into it, that the men were obliged to hold up the tent to windward during its completion. We had barely got ourselves snug and commenced breakfast, when the storm burst upon us, seeming to threaten the tearing up of the very snow in which we had taken refuge; and had not former experience taught us to fortify our tent well all round with banks of snow, I have no doubt it would have been the last we should have seen of that article of furniture. Being satisfied that all was snug, and that the worst which could happen to us was that we might be buried a few feet in the snow, we went to sleep. When we awoke at mid-day the

storm had subsided and the fog had lifted, showing three dark mountains to the north—doubtless Skjaldbreið, Herðubreið, and Dyngjufjall.

We were speculating as to whether we should go on in spite of the still threatening aspect of the weather, when the fog returned, and the booming wind announced another storm to be close at hand. Presently it broke upon us; never before had I heard the wind make such an unearthly wail. It seemed as if every imaginable demon and all the storm spirits of that wild region had assembled to howl and make a united attack upon us. The light was fast becoming obscure, and we were getting fairly snowed up, but that made us all the warmer, all the more secure, and the shrieking of the storm was deadened by the friendly covering. We partook of some chocolate, smoked and sung, and finally slept again. At 8 P.M. the storm had somewhat subsided, and I sent out a man to clear away some of the snow from the roof of the tent to let a little light in. The snow had drifted nearly over the tent, and it took some hard work before we were dug sufficiently out to let in enough light to write by; outside there were 10° of frost, but we were comfortably warm in the tent. The air outside was so full of snow that we could not see a couple of yards in advance. Another day showed us only a

continuation of storm and snow which utterly prevented progress. We had now only about a week's provision left, so I again put every one on half rations. The men were obliged to take turns in clearing away the snow, at intervals of every three hours, from the top of the tent, and before very long the tent had the appearance of lying at the bottom of a deep hole in the snow. We passed the time as best we could, by sleeping, eating, smoking, writing, singing, spinning yarns, and I occasionally amused the assembly by learning strings of Icelandic words by Mr. Stokes's method of mnemonics, and repeating them in order, either backwards or forwards, which puzzled the Icelanders not a little.

Before I started for the Vatna in 1871, I remember saying I should like to see one of its worst storms: I now had that gratification. Storms are interesting natural phenomena, but when prolonged indefinitely are, to say the least, tedious hindrances to progress; and now, lying upon the top of the Vatna Jökull, with the possibility of their lasting for a month, and provisions materially diminishing, their dreary monotony became intolerably oppressive, and after mature consultation we all came to the conclusion that if the weather did not clear in two days' time, we would leave all impedimenta behind, except provisions, instruments and my diary,

and strike northward, storm or no storm—"*sauve qui peut.*"

When we lay down and were fairly snowed over, the booming of the storm sounded as if it came from the interior of the mountain, and almost any familiar sound could be singled out from the hurly-burly in an exaggerated degree, without any great stretch of imagination. It stormed all night; the wind "Trolls" shrieked around us, the thunder of the storm roared through the, to us, dark midnight hours, surging upon the icy bosom of the Jökull, sweeping up its snowy slopes, bearing with it avalanches of snow-drift which had buried us several feet deep by morning. By 5 A.M. it lessened somewhat, the furies of the Vatna appeared to have given up the idea of overwhelming us, and the disheartened tempest sunk away in melancholy sobs, but a determined drift and south-west wind persevered in harassing us.

It was clear that we must now start forward, for not only was there a considerable amount of snow yet to be traversed, but a howling wilderness of volcanic sand, lava, and mountain torrents had to be crossed which lay between the north base of the Jökull and the nearest habitation. We could not remain in our present position, so deeply were we buried, and so difficult was it to get in and out of

the tent; moreover the fury of the storm had beaten the snow hard, so there was no time to be lost. I served out a hearty meal, and as packing up under such circumstances seemed to demand some stimulant, I made some grog out of methylated spirit, for all our whisky was gone. This served to quicken our circulation, although it was far from being palatable, having, as my Icelanders said, "slœmr dropi," or a bad after-taste, and no wonder, as the first taste was not suggestive of an agreeable sequel. We packed, but with great difficulty, owing to everything being frozen quite hard. Upon leaving, I drew over my mocassins a pair of fishing stockings; they were as hard as sheet iron, and were a very great inconvenience to me; but it was too cold to stop and take them off, for it seemed as if we should freeze as we stood. These stockings had been of great service in keeping me dry hitherto, and I hoped they would protect me now. I felt a hard lump in the bottom of my left stocking; if it was snow it meant a frozen foot. But there was no help for it—we could not think of stopping to change foot-gear in such a tempest. The wind had shifted to the west, almost freezing the side exposed to it. We steered N.N.E.: it was fortunate the wind was almost at our back, for we could hardly have faced it.

After three hours' hard tugging we reached the the height of 6,150 feet, and straight away began to descend, and presently at so rapid a rate that I had to send three men behind, in order to prevent the sleigh from starting on its own account for the bottom of the mountain. Suddenly the clouds cleared away before us, disclosing a deep, snowy valley at our feet, and a tall black mountain, streaked with snow, upon our left and west. Lower and lower we descended, more and more precipitous, till it was evident that we could go no farther upon our present course with the sleigh; so Paul and I went forward to explore. The side of the valley terminated in almost perpendicular walls of snow, which were now frozen perfectly hard, and glazed over by the severity of the frost; the opposite side was more broken, with dark crags here and there protruding, while a copious lava stream appeared to flow northwards from the termination of the snow, though I afterwards found that a fringe of glaciers intervened.

We next decided on striking due north, along the sloping sides of the valley, to what we supposed to be Querkfjall, but afterwards found to be Kistufell. Upon returning to the sleigh, while putting back my field-glass, which I was obliged to do barehanded, for my gloves were a mass of ice upon the outside, my fingers began to freeze; but a little hard clapping,

and by getting two of my men to beat them with their hands, the circulation was restored. I now ordered three of my men to put spiked iron clamps upon their feet, for without this precaution I doubt not but we should have ended our career, sleigh and all, by an abrupt descent into the valley beneath, unless we had been stopped by some of the ugly crevasses which yawned half-way down the snowy steep, upon the slippery and precipitous sides of which we were descending.

We proceeded, but with great difficulty; our trouble now being, not that the sleigh was hard to get along, but that it would go too fast; in fact, it seemed likely to run away with us altogether. Behind us was a fierce wind, beneath us a precipice of some 800 or 1,000 feet; and the sloping snow-banks we were treading shelved off at such an alarming angle that it rendered the work more dangerous than pleasant. In this critical position I became painfully aware that I had frozen my left big toe; for the increased exertions and the lessening altitude were causing it to thaw. The pain was horrible; but presently the slope became less abrupt, and we stepped along at such a rate that 1,500 feet were negociated with considerable speed. Hurrah! we were again in bright sunshine; but the moment we stood still, the wind cut us to the bone. Before us

lay the long looked-for Norðurland. We arrived at the bottom of the valley, and found it full of loose snow, which was knee-deep, for the crust was here much too light to bear our weight, and at every few feet we sunk into a miniature crevasse. After struggling on for some few hours, however, we pitched our tent.

Right thankful was I to get some warm soup and creep into the bag. One of my men—and a real good fellow he was—named Sigurð, cuddled my left foot in his arms, although my writhings kept him as well as myself awake while the others slept. I have had many parts of my body frozen, but I never suffered so much as from that toe.

After a few hours we again started; and although the sleigh travelled easily over the crust, we still broke through it, which occasioned me so much pain at every step that I sat upon the sleigh and was drawn along until we had descended so much that the crust ceased altogether. The snow terminated in a half-melted slush, lying upon a bottom of ice. Wading through the slush, which at times took us up to the waist, we next reached Kistufell, where the ice and snow terminated. Here we landed on a bed of volcanic debris, which covered the ice to such a depth that one could in no way, except by digging, distinguish it from the adjacent fjall. The Vatna Jökull now lay behind us with its mysterious recesses and

volcanoes carefully guarded from intrusion by gloom and storm. To the north of us rose a cluster of mountains from which great quantities of steam were rising, and hovering above their summits in a huge mushroom-shaped cloud; to our left and west lay a wide-spreading lava-field, arms of which stretched amongst the neighbouring mountains like the troubled waters of a cindery ocean. Patches of black sand at intervals broke the continuity of this tract of lava, and culminated in a desert still farther to the north-east. Beyond, all the weird forms of fire-wrought mountains formed a fitting back-ground; their rude outlines rendered still more uncouth and grim by the fierce storms of ages. A huge tongue of glaciers at this point swept down to a distance of some ten miles beyond its most northern limit, as represented upon the map published by Olsen in 1844, from a survey made by Gunnlaugsson, in 1835. I here caught sight of Snæfell; and, upon taking its bearings with the smoking mountains, which were evidently the Dyngjufjall, I found that instead of being at Querkfjall, which was the point I had intended to strike, we were upon the east side of Kistufell, about ten miles too much to the west. What astonished us most was (granted that we were at the east side of Kistufell) that we could see nothing of the Jökulsá-á-fjöllum, which river, upon Olsen's map, rises at the

foot of Kistufell; besides, upon his map the Jökull ends at Kistufell, while here a huge glacier extended east and north-east as far as the eye could reach, though exactly to our north and north-west it terminated abruptly, and only an insignificant river flowed to the north. We here abandoned our sleigh and snow-shoes which had served us so well, and whatever we no longer required, and, making everything into packs, continued our descent over huge piles of moraine, which doubtless covered glacial ice, buttresses and points of which here and there protruded. Having slidden down several steep slopes of snow, which had collected in all the hollows, affording us ready means of descent, we found ourselves at the height of 3,850 feet, in the bed of what evidently had been a large river, though now only an insignificant stream.

To our east and right stretched the immense glaciers before mentioned, completely overrunning the route taken by Gunnlaugsson in 1835, and diverting the source of the Jökulsá, which rises in several arms from the extremity of the glacial tongue before mentioned. Upon our left and west lay the wide-spreading lava-desert of the Odáðahraun.

Our way over the sandy bottom of the grand old watercourse was an easy one to travel, for the sand had absorbed sufficient water to make it firm and

compact. Our attention was engaged for some time in watching the fanciful shapes that crowned the dark wall of ice upon our right, on the opposite side of the stream which now lay between us and the glacier; and now and then we could not help stopping to peer into some of the dark chasms which seemed to penetrate into the heart of the icy monster, and to admire the little cataracts of foam which spouted from clefts in the dark green ice, or to wonder at some icy pinnacle or turret, that ever and again tumbled from, perhaps, some few hundred feet above us with a roar and a splash into the river, there to be slowly melted, while the sound of its downfall echoed and re-echoed amongst the cavernous openings in the glacier from which it had fallen! After an hour or so we settled on a low sandy island in the middle of the river, which must have formed formidable rapids when the immense stream that had hollowed out this mighty watercourse had roared over its bed; but it was shallow enough now, and by judiciously picking our way it scarcely reached up to our knees as we waded to the little island. I here noticed, as I had often done before, an intermittent occurrence of waves in certain portions of the stream. These, in large rivers, are rather terrible things, but here they were on so small a scale as to make their examination simply a safe

indulgence of harmless curiosity. These waves occur in all the sandy rivers, and they are occasioned by the sand and detritus, which is brought down by the river in large quantities, accumulating against some obstacle until such a time as it forms rapids, which increase in proportion to the durability of this suddenly-formed sandbank. In most cases it readily yields to the action of the water, and is carried away; if, however, the material which is thus piled up should be of a heavier character than usual, it soon accumulates to such an extent as to resist the action of the water altogether, and cause the current to alter its course. This shows how the rivers of Iceland may be diverted and changed from this cause alone, converting shallows into deep water, and deep water into shallows, indeed altering the position and character of the rivers altogether.

As we laid down, the volcanoes in the Dyngjufjall were smoking away with increased violence. My frost-bitten toe would not allow me to sleep much, so after a doze of two hours we started on our way; we had but two days' full rations left, and as Grímstaðir was the nearest farm, a series of forced marches was necessary. Before us to the N.E. was a cluster of hills, which stretched from the southern extremity of the Dyngjufjall in a S.E. direction towards the Jökulsá, upon the east and west sides of

which valleys appeared to open northwards. Wishing, however, to get a good view of the country before us, as neither of us had been here before, and it was a matter of paramount importance that we should make no mistake as to the direction, I decided to steer for the centre of the hills, and to cross them. For a short distance we skirted the tongue of the Jökull, past a line of moraine which shewed that the glacier had ebbed as well as flowed, then bearing more to the north, after a hard walk of three hours we reached the hills before us. They were composed of the usual confusion of agglomerate, sand and lava, which had issued from it—it was impossible to say where; but they were evidently of a very ancient date, and many of the harder rocks were glaciated, while the softer ones were simply ruinous heaps. After an arduous scramble, we crossed these hills and reached the little desert of black volcanic sand we had seen from the northern edge of the Vatna Jökull. This sand plain lay between the Dyngjufjall and a chain of mountains upon the opposite side of the Jökulsá-á-fjöllum. It was now raining somewhat heavily, but there was no fog; the burdens of my men were heavy, and I was carrying all I could manage with my bad foot. Under these conditions we were obliged often to rest, which much hindered in our progress. We sighted some low,

black, misshapen volcanoes, about half way across the plain, and near these we determined to camp for the night. Two hours brought us to a field of lava which had flowed from and surrounded those eccentric little volcanoes which rose in four ghastly eminences in the centre of the plain, in no part more than 100 feet high. Tired as I was, and greatly inconvenienced by my foot, I could not refrain from examining them. They were situated upon a crack from which the lava had welled up in four mamelonic shapes, which in two instances showed irregular breached craters, nearly filled with sand, which had been drifted thither by the wind. The lava was basaltic, and of a remarkably scoriaceous nature, though in the immediate neighbourhood of the volcanoes no cinders were visible around them, so their eruptions must have been attended with but little of explosive character.

The worst feature of our night's lodging was the absence of water, so I ordered the waterproof coats to be spread out to catch rain for our use in the morning.

It was 1.30 a.m. before we all turned in for the night. Sand is warm to camp upon, but it gets into everything, and when one is wet it sticks to clothes, &c., in a most objectionable manner. By six a.m. we were all awake, sufficient water had collected

for immediate use, and we were soon all under weigh over the lava, which in most places flowed very evenly, and being of a more compact character than that which was close to the volcanoes we had just left, had allowed little pools of rain water to collect upon the surface. We marched for four hours, and then struck a large river upon our east. This was the Jökulsá-á-fjöllum. After following its course for some time, we decided to "cache" everything but the remainder of our provisions, our maps, and my diary, for it was my intention to return with horses to the Dyngjufjall mountains which now lay to our N.W., when I could recover them without much difficulty. Having carefully made our "cache," we planted a flag-pole upon an adjacent sandbank, and having carefully taken its bearings, struck for the Vaðalda hills, which were not very far distant. These hills run for some nine miles parallel with the course of the Jökulsá; their base being washed by the Svartá, or Black river, which rises in the Dyngjufjall, but is soon lost in the sand, re-appearing on the Svartá at the commencement of the Vaðalda. Upon the opposite side of this river we found a root of angelica (Icelandic, *hvönn*), the stem and root of which we shared and ate with great relish; we also saw two white sheep, but how they manage to eke out an existence must have puzzled their sheeps' heads not

a little. Though, proverbially, two heads are better than one, I doubt if the proverb would hold good in their case, but there may be some grass in glens which I have not seen in the Odáðahraun, where enough herbage may grow to feed Icelandic sheep, as they are not very dainty, and are accustomed to short commons.

The Vaðalda hills, although of no great height, command an extensive view towards the Vatna Jökull, and upon reaching their summit I glanced back over the plain. It was one broad wilderness of black sand and lava, girt about with ridges of volcanic mountains, whose numerous cones and chasms have vomited the immense amount of ash, sand and lava with which the surrounding country is covered. In the centre of the plain rose the little volcanoes by which we had encamped the previous night, grimly and perkily protruding, as if they aped their monster brethren around them. Beyond all was the wide, white expanse of the Vatna Jökull, from which a huge tongue of glacier extended more than half way across the plain; from its extremity commenced the river we had been following (the Jokulsá-á-fjöllum), which stretched through the black bare plain sometimes in many arms, enclosing little islands of black sand and pebbles in its sinuous embrace, then surging along through a single deep channel it had worn for

itself in the sand, where the unstable banks, even while we gazed on them, were crumbling and falling in, patch after patch of sand rendering still more murky its already discoloured waters.

From here I obtained the first good view of the Querkfjall, which appeared to be a cluster of conical mountains, one huge crater being on the northern side of the Vatna Jökull. This large crater, though partially filled with snow, was smoking at three points, but presented no other signs of activity. Having advanced about a mile upon the Vaðalda, we were soon upon the pumice which was ejected last year from the Öskjugjá, or chasm of oval casket, in the Dyngjufjall mountains. It has fallen in a line of about twenty-five miles in breadth from the centre of the Vaðalda to the south of Herðubreið, in a band of continually extending ladià eastward towards the sea shore, destroying in its course six farms in the Jökul-dalr, and injuring others in the immediate vicinity. This shows that the prevalent winds during the eruption of Öskjugjá must have been south-west.

This pumice is of a remarkably vitreous nature and vesicular in structure, often assuming very beautiful forms, such as sponge, honeycomb, coral or grained wood. As far as the eye could see, the whole country was buried under greyish cinders,

often to the depth of several feet; while in places it had been swept up into huge banks of many feet in thickness by the wind, sometimes burying whole lava fields, the more elevated crags of which protruded, as if struggling to get free, and proclaim the existence of the lava stream underneath. We descended into a valley in which everything, like the surrounding country, was covered with the same white greyish pumice, except where the darkly-flowing river wound silently along, deep, black and foul, bearing upon its surface floating islands of pumice.

The pumice had evidently fallen upon the winter's snow, for a thick layer lay underneath, protected by the cinders from the influences of the summer temperature. Ever and again this substratum gave way, and we sank deeply into a mixture of snow and ashes. It was trying work, but we were well warmed, and pushed on at a good pace. We again climbed to the crest of the hills, and another valley opened to our view, running S.S.E., and another river not marked upon Olsen's map helped to swell the waters of the Jökulsá, while the river at our feet poured through a rocky chasm it had worn for itself; further on was a jam of floating pumice which blocked up a portion of the river, causing it in some places to look precisely similar to the adjacent

ground. Presently, a wide plain opened before us, from which rose a lofty mountain, shaped like a huge pork-pie, crusted over with ice and snow upon its flattened summit, which rose gradually to a fantastic, ornamental apex in the centre. This was Herðubreið, and it was at once recognised by Paul, who had been in the north of Iceland before. Beyond Herðubreið the country was of a darker hue, no doubt caused by the absence of the pumice, which had not fallen upon the sand and lava desert of the Myvatns Örœfí. We now halted to determine our exact position. We found we were about forty-five miles from Grímstaðir, and upon the north end of the Vaðalda, and as it would be necessary to hit the exact spot where the boat was kept, Grímstaðir being upon the east side of the river and we upon the west, we agreed to follow the course of the Jökulsá. This river, in the map, appeared to flow pretty nearly straight, but in reality does no such thing. As food was getting short we took a light meal off our pipes, and reviewed our supplies. We had a half-pound pot of chocolate and cream, about a pound of hard tack, half a pound of butter, and three square inches of "gravy soup"—rather short commons for six men, with forty-five miles, at the very least computation, of the very roughest country possible before them, and which, as we intended to follow

the course of the river the greater part of the way, would be sure to develope into considerably more.

There was a lovely yellow sunset as we descended the northern slope of the Vaðalda; the sun was waning towards the north, and the ashen covering of the surrounding mountains reflected an unearthly light, which added a ghastly grandeur to the chaotic desolation through which we were passing, while we ourselves, dirty, brown, and wayworn, as we travelled almost noiselessly in our mocassins over the ash-strewn ground, seemed fitting representatives of the outlaws and evil spirits with which tradition had peopled this wild region. A very suitable abode it seemed for all of evil omen, but even such must have had a hard time of it if the country were in their day such as it is now, which probably was not the case.

By two a.m. we rested, purposing to take a couple of hours' sleep. I scooped out a place for myself in the cinders, and lying down under the lee of a large stone, covered myself over with my mackintosh coat. Unfortunately my men could not sleep as they were so cold, so we soon resumed our journey. At five a.m. we were due east of Herðubreið, where we took a slight meal, the most prominent feature of which was water from the Jökulsá. We were travelling over an old lava stream nearly covered

with pumice, and the river had assumed formidable proportions, having been joined by a third arm upon the east side, which roared over the lava in its bed. The sun was shining brightly, the clouds were beginning to melt away from the summit of Herðubreið, leaving a cloudless sky; a slight frost was glistening upon everything and stiffening our beards, the pumice was getting thinner and thinner, and presently altogether disappeared. Before us lay a broad waste of sand and lava, and in the far distance loomed the mountains of Mývatn, which Paul recognised as old friends, as some years of his life had been spent in the Mývatn sveit. For the first few miles my foot troubled me a good deal, but as soon as I got warm the pain ceased, and as the day promised to be hot, we made the most of these early hours.

Following the course of the river, we found ourselves upon a plain of sand and pebbles, and as we advanced, a little scanty herbage began to make its appearance, while occasional sheep tracks showed that sheep in this quarter were, as usual, wont to stray from richer and more plentiful pastures to those which afforded but a poor and meagre supply. By 8.30 we reached the little river Grafalandá, which here flows into the Jökulsá; and here there was plenty of grass. The sun now shone warmly, and as we

were not more than twenty-seven miles from Grímstaðir in a straight line, we lay down and slept for two hours. Upon rising we still followed the river, which, as before remarked, is by no means a straight one. Our road now lay through a considerable quantity of thick herbage, principally galix and coarse grass. Some hills here interrupted our progress, the base of which was washed by the river, and since no way was possible between the river and the over-hanging cliffs, for the river here took a great turn eastward, we decided to ascend the hills. The summits of these, as is often the case in Iceland, were formed of stones imbedded in sand and decomposed rock, after the fashion of a loosely macadamized road. This is doubtless caused by the heavy covering of the winter's snow, which presses down the stones, and then as it melts converts the material in which they are embodied into slush, into which the fragments of rock, &c., readily sink, so that when the water has drained off and the fine weather comes, it is found transformed into a kind of cement, for the decomposed fellspathic lavas especially set very firmly under such circumstances. By three p.m. we reached a delightful little mountain stream brawling over the rocks and lava, fertilizing the parts of the mountain through which it ran, and calling into birth green borders of galix and grass, form-

ing a beautiful little cascade directly in our path. Here we halted; the sun was intensely hot, but it felt rather comfortable than otherwise. Here we found an abundant growth of angelica, which we ate with the remainder of our provisions. We then washed our socks and laid down to sleep, lulled by the bubble of the stream and the sweet fresh smell of the herbage around us, which our long absence from everything that could produce so agreeable an aroma rendered all the more welcome.

Evening came before we again started, and our road was through a deep loose sand, which was very trying and heavy to our feet, for beneath this was a layer of pure white ash of the consistency of flour—probably decomposed pumice. When this was mixed with sand, it seemed to be a good fertilizer, for wherever it occurred a patch of wild oats was the invariable result. Before we again reached the river, we found it cut directly through a cluster of low mountains, striking a field of very dark and almost vitreous lava. By midnight we sighted Grímstaðir to the S.E., upon the opposite side of the river, although at some considerable distance, and the ferry was beyond the farm, to the north of it. We followed closely down the bank of the river that we might not miss it, for there was no track to guide one across the Mývatns-Öræfí, and

it was a good three hours before we found the boat, which was a leaky concern, but by dint of baleing and rowing we eventually reached the opposite side. Five a.m. saw us arrived at Grímstaðir, much to the surprise of the occupants, who had not at all expected the intrusion of six men *on foot* at such an hour, and from such a quarter.

The bóndi having been roused, the whole establishment turned out to have a look at us. Grímstaðir was decidedly the best and most extensive farm I had seen in the island, except, perhaps, Breiðarbólstað in Rangarvallasýsla. The bóndi was a good type of the genuine old-fashioned Icelander, and everything in the place was cleanly and comfortable. Ha had passed all his life in the north of the island, and had not ever journeyed to Reykjavík.

There was a good-sized windmill in front of the farm, to grind the rye and wheat sold by the storekeepers; and this was a very great improvement upon the old stone handmill so generally used in other parts of the country, especially in the south. Windmills seem to be rather a characteristic of the north of Iceland. My first object was to procure coffee and a good meal; this having been secured, I proceeded to purchase four sheep, and give instructions for their death and disposal. One was

destined for immediate use, the other three to be made into pemmican, their skins being dried for carriage to England.

What a glorious institution is a bed! What a happy thought it was of the man who first conceived the idea of taking off his clothes before turning into it! What luxury! a tub, hot water, soap, a sponge, a towel, clean sheets, an eiderdown quilt, a little tallow for my poor sore nose, and sleep! What sublimity of comfort! Well, I slept as only a well-worn traveller could sleep, till I was roused by the novel sound of a knock at the door of my room. "What's the matter? Who's there?" My watch said twelve o'clock.

It was the bóndi's daughter, with coffee and a plate full of delicate little pancakes, each carefully rolled up with a few raisins inside, and nicely powdered over with white sugar. Forgive the weakness, good reader, but that little tray! Can I ever forget it or its contents, to say nothing of its comely bearer? Will I have any more? Oh yes, by all means. My mid-day meal became an interesting speculation, to say nothing of the comely bearer of it, through whom I ordered sheep's fry, and ere long was greeted with its savoury smell.

Paul had gone to Reikjahlið to try and hire a man and some horses to enable us to go to Öskjagja

(the volcano we had seen smoking), for my own horses had not yet arrived, but I learnt that it was almost impossible to obtain either horses or men, as all were engaged in gathering in the hay harvest.

In the afternoon two students arrived from the college at Reykjavík to spend their vacation in the north, and a merry evening we had of it with my men, who were in high spirits at having fairly reached the Norðurland by a route which had never before been trodden by the foot of man, since their island first rose above the waters of the North Atlantic—a feat that would immortalise their names in local Icelandic history!

We had then travelled from Nupstað in the south of the island to Grímstaðir in the north, a distance of about 270 miles, in sixteen days, twelve of which had been passed amongst the regions of perpetual snow. I must here remark that the pluck, perseverance, and obedience of the Icelanders who accompanied me are deserving of all praise; for without them I could never have crossed the Vatna Jökull. The next day was Sunday, and at breakfast I was informed that the bóndi would read a service in the baðstofa, an apartment for general use. This room was filled with little truck bedsteads, and somewhat reminded me of a hospital. All the household were gathered about, neat and orderly,

sitting on the bedsteads, and the service consisted of singing, reading, and prayer.

One cannot help noticing the softening and harmonising influences of all forms of civilized religion when not clouded by fanaticism, more especially among those whose lives are spent in close contact with the ruder elements of the world.

The beautiful clear sunny weather continued, enabling us on the following day to obtain a good view of the distant hills of the Mývatn, across the arid waste of the Mývatns Örœfí, where occasional puffs of wind were raising small clouds of the light volcanic sand, carrying them high into the air. Sometimes, too, circular currents raised screw-shaped columns of sand, which now and then increased to rather formidable dimensions, and even crossed the Jökulsá, blinding the chance traveller, and scaring any stray sheep that might be cropping the tufts of scant herbage sprinkled at long intervals over the plain.

The volcano in the Dyngjufjöll was smoking away with greater ferocity than ever, and the dark columns which formed the centre of the great mushroom of vapour which still hung over these remarkable mountains showed that something heavier than steam was being ejected.

Paul returned in the evening with a man from Grœnavatn, named Thorlákur, who was to accom-

pany me to the Ódáðahraun and the Dyngjufjöll, but my difficulty lay in not having sufficient horses, as Paul had found it impossible either to buy or hire more than two, and they belonged to Thorlákur; and as I could not afford to wait for my own, I was compelled to modify my plan of operations. Requiring a fresh supply of necessaries, I first despatched Paul to the stores at Vopnfjörðr, and then, with the rest of my men and Thorlákur, set out for the Ódáðahraun on foot, one horse carrying hay and the other provisions. Our first stage was to be the Grafalandá, where there was plenty of grass, and our next some point between the Dyngjufjöll mountains and the river Svartá, within easy reach of the baggage I had left behind. From here I determined to start with Thorlákur and Eyolpur, while the rest returned to the Grafalandá with everything we did not absolutely need, directing them in the meantime to fetch more provisions from Grímstaðir, and a sufficient number of my own horses (which doubtless by that time would have arrived) to carry us and our belongings from the Grafalandá to Mývatn.

In the evening two of the farm servants, who were refugees from some of the devastated farms in the Jökuldalr, recounted their experiences during the eruptions of last spring, which, however, by no means damped the ardour of my men.

The next day was spent in completing my preparations, and in the evening, we bade adieu to Paul and our good friends at Grímstaðir, after which we again turned our faces towards the mountains.

My supplies now consisted of 50 lbs. of pemmican, 25 lbs. of bread, 10 lbs. of butter, two large dried trout from Mývatn, and about half-a-gallon of corn brandy.

Having crossed the ferry, my attention was arrested by a small crater orgjà (chasm), as the natives called it, which had opened in the plain about two miles to the west; it was an ancient vent, named Hrossaberg, and many similar to it occur in the plain of the Mývatns Örœfi. The fissures which had erupted in the spring were of a like nature, and the heated lava from them we could just perceive farther to the west, looking like a black bank, while from it little clouds of steam were occasionally rising, and a thinnish, darker vapour overshadowed it; and even at the distance we stood from it pungent exhalations were perceptible. We continued on our way towards Herðubreið in a southerly direction, over a desert of sand and lava streams which had intersected and flowed over one another, but my foot still greatly inconvenienced me, though I had given it entire rest during my stay at Grímstaðir. At five a.m. we stopped for half-an-hour to let the horses refresh

themselves at a patch of wild oats which here grew rather abundantly in patches, generally in shape and size rather resembling ordinary haycocks, so that in the distance they often made the plain appear as if it were covered with hay in cocks all ready for carting. The peculiarity of their form is doubtless due to the roots that protect the sand in which they grow, while the sand on the surface of the surrounding plain is being constantly swept away by the wind.

We were now in a line west of the hills of Grímsfjall, which are not marked upon Olsen's map. We pursued our journey with the morning sun, and it is surprising what an effect the sunlight has upon one, to refresh, cheer, and revive one's strength. I have often remarked (and others have told me they have done the same) that, when travelling all night, the sensation of weakness and weariness is most felt between the hours of one and three o'clock in the morning, but as soon as the sun appears there is a consciousness of refreshment almost as though one had slept.

We perceived a small quantity of steam, perhaps from a hot spring or a fissure in the lava, about seven miles to our west, but I could not spare time to inspect it.

We next reached the Grafalandá, which is a small river taking its rise north-west of Herðubreið, and

flows north-east into the Jökulsá. This water no doubt comes from patches of snow upon the Dyngjufjöll, the Trolladyngjur mountains and Herðubreið, and as is generally the case around these mountains, loses itself in the sand and lava at their base to reappear as a stream when it can no longer find a subterranean passage. The banks of this stream were covered with dwarf birch and salix, but the larger wood was dead, and this would seem to show that the woods were more extensive and of a stronger growth in bygone years than at the present time. I have observed this in other parts of Iceland. There was also here an abundance of grass, making it an excellent halting place for anyone desirous of exploring the adjacent mountains. It was in this vicinity, tradition tells us, that the last of the Icelandic outlaws found a shelter, and, as late as a hundred years ago, one man, named Eyvindr, lived here for a considerable time, and a cave in the north of Herðubreið hill memorialises his handy-work, in the shape of a horse carved upon its roof or walls. He appears, however, to have been by no means of terrible character, and was in great favour with the country people.

We next moved on to the river Lindá, about four miles in advance, and three miles north-east of Herðubreið. Here there was good grass for the horses, and angelica grew abundantly, and the stems and roots

of it were very acceptable and refreshing in a region so void of vegetable life as this. I wonder the inhabitants do not more cultivate it in their gardens, for I believe it would be quite possible for them to acquire a national fondness for it as a staple article of vegetable diet.

A short trudge over the lava brought us level with Herðubreið, and here we soon began to observe signs of the volcano in the Dyngjufjöll in the shape of the peculiar vitreous pumice I have before mentioned.

Weary, weary work for sore feet this pumice-deluged country. Many masses were four or five feet in circumference, but the majority varied from the size of a man's hand to that of a wine cork. In many places it had drifted into huge beds, which was bad enough for us to travel over, but it was still worse for the poor horses, who seemed much fatigued with their journey. In ascending and descending these large cinder heaps, great quantities would often suddenly shift, leaving us deeper than our knees in dust and pumice. We were steering west of the course we had taken from the Vatna Jökull, and the pumice was thicker than we had yet found it; while occasionally we met with round white masses of lava glazed over upon the outside, but when broken they disclosed a highly vesicular nature in their interior. This stony shower must

have been appalling, especially when accompanied by darkness, floods of scalding water, and mephitic vapours.

The dust occasioned by our progress was excessively trying to the eyes, and even penetrated our clothes. In many places floods of water had evidently flowed from the direction of the volcano. The pumice was rapidly decomposing under the action of the atmosphere, especially where it was wet, and a great deal of it appeared to have been ejected in a wet state, and had since absorbed a kind of wet earthy matter, which seemed materially to assist its decomposition. These floods of water from volcanoes which are neither glacial nor snow-capped mountains, can only be explained in two ways, either by supposing the water to have accumulated as a subterranean lake in the chimney of the volcano, or that it was previously entangled in the very elements of the matter ejected. We were now leaving the Vaðalda hills to the east, and we could see by what a tortuous course we had travelled by keeping so close to the river Jökulsá on our journey to Grímstaðir. At two a.m. we rested and gave the horses some hay, for they were very tired, and most of my men had scarcely recovered from their long march. After an hour's rest, we again moved on; the men were suffering much from thirst, for Icelanders drink

more water when on a walking expedition than any people I ever met with, which I suppose is because they are accustomed to consume a great quantity of milk when at home.

The pumice became finer and less deep as we advanced, and remembering it had fallen in the winter, I dug through it to reach the snow, which greatly relieved our thirst. We were now between the Vaðalda and the Dyngjufjöll mountains, and from the top of a lava field, almost buried beneath the pumice, we beheld the broad sand plain we had crossed upon our journey from the Vatna. I here noticed some rounded masses of lava, which were just the reverse of the bombs I had seen before, being harder and more compact in the centre than upon the exterior. The pumice now grew less and less, and a gentle slope brought us to the sand plain; so, having deposited our loads about one mile south-east of the Askja, and two west of the southern extremity of the Vaðalda, I despatched two men with the horses to seek the remainder of the belongings we had left a week before upon the sand, about four miles away to the S.S.E.

We then pitched by the side of three or four large shallow pools of water, formed by several small streams which here run from the Dyngjufjöll and lose themselves in the sand, reappearing, as I have

before described, as the Svartá, a few miles to the S.S.E.

The sand was very trying, for a westerly wind filled the air with clouds of a most irritating dust. It was some time before the men returned, when they informed me they had seen several sheep, looking plump and well, and had found some grass near the source of the Svartá, where they had given the horses a rest. Having taken a good meal, I sent three of my men on their return journey, for we had not sufficient hay to keep the horses any longer. I was now left with only Thorlákur and Eyólfur, so we pitched our tent in order that we might take a good sleep before setting out for the Dyngjufjöll. The wind had died away upon the plain, the sand no longer troubled us, the sun was shining warmly, so after our long journey we were rewarded by a most refreshing sleep. Seven p.m., however, saw us again on our legs. I had determined that the volcanoes of Öskjugjá must be north-west of our present position, and therefore decided to take a northern course along the E.S.E. face of the mountains, and take the first *gill* which should anyway lead in a westerly direction. I also arranged for five days' provision to be taken with us, and the remainder to be *cached* upon the sand. Our whisky was now reduced to two small bottles full, for I had

been compelled to be rather liberal with it the previous night. I therefore directed that a pint or more of water should be placed in the keg, and this we left in the cache to await our return.

Having crossed a few small streams to the north, which flowed into the pools by which we had encamped, the road became tolerably good, being formed of very fine pumice, sand, and mud that had evidently been cast up by the volcano in question. This, in all probability, had been showered down towards the termination of the eruption, when the pumice had been many times ejected and swallowed again by the volcano, thus reducing it to very small pieces, lapilli and mud,—while at the same time the eruption itself was waxing feeble. Our good road terminated after about three hours' walking, and then we trod again upon a series of heaps of large and most execrable pumice. All night we continued our difficult progress, but no *gill* presented itself, up which we might turn towards the object of our search.

My position may be imagined by the reader supposing himself toiling over vast piles of rotten cinders, with 20 lbs. weight on his back, in wet skin socks, with villanously sore feet. The circumtances demanded a halt, for the sun was beginning to show itself in an arc of misty, crimson light,

which grew broader and broader and more vivid with approaching day. To our left there arose crags to the height of over 1000 feet above us, their sides being draped with slopes of lava and shifting pumice. Around us were misshapen rocks and conical eminences, carrying our thoughts back to eruptions in bygone ages of the volcanic fires beneath. Here was a chasm, yawning widely where it had not been filled up with pumice, while many others cut deeply into the flanks of the surrounding mountains. These were probably the result of the earthquakes which had preceded the recent eruptions; while in the north of the volcano we were now ascending they were very numerous, but I did not observe any to the south of it. The wind was blowing from the east, and hitherto the volcano had not troubled us with its noisome smell; but as the heavy midnight clouds began to roll down the mountain sides, a pungent sulphurous odour reminded us that the dread power which had created the wilderness around was still alive, though somewhat feeble, in the heart of the mountains which seemed to scowl upon their nocturnal intruders. The snowy turban of Herðubreið, however, was glowing in the sunlight, and the bright face of the luminary broke through the eastern mists, showering beautifully upon the cinder-strewn country around us the heavenly gift of morning sunlight.

"Já blessuð sólin," exclaimed both my companions. "Aye, the blessed sun!" and we all for some minutes silently watched the approach of the tutelar spirit of Icelandic travellers. Who can wonder at the uneducated or the uncivilized worshipping the sun? crude nature always regards what it cannot understand with superstitious fear, and sometimes with love and worship, and if we did not recognise in all a great Primeval Cause, we might worthily deify the sun; but it was useless to lay dreaming and it was too cold to lie still, and lying still would not get us up the mountain, for up the mountain we were fain to go. We had already gone too far to the north, and as there was no gill, we must needs climb straight up, and steer for the thickest steam and the foulest smell; in short, when our eyes failed, to follow our noses.

Toiling up the sides of the mountain, the mist thickened, while dense clouds settled around us as though they would draw us into the volcano; the smell grew sickening, and the pumice more muddy. What was falling, rain or sand? Neither; it was a kind of fatty loam, falling in coarse granules, the smells from which were most offensive, and it was very fortunate we were almost to windward of the volcano, or progress would have been impossible. My aneroid here marked 3500 feet, and as higher and higher we

climbed the mist cleared a little, until we stood upon the top; while beneath us lay a pandemonium of steam and hideous sounds. Suddenly a fearful crash made us stand aghast; it seemed as if half the mountain had tumbled in upon the other side of this horrible valley, and for some time we could see nothing for the dense clouds of steam which seethed up before us, and the heavy rain of loam which was falling, while the most hideous shrieks, groans, booming and screaming sounds rose from all parts of this terrible depression, the bottom of which was now utterly obscured. Again and again came a crash and a roar from the opposite side, and also occasionally from the side we were standing upon. The sides of the crater were evidently falling in, and huge wide cracks, even where we stood, showed us that our position was not altogether a safe one; but the wind was clearing the clouds away, so, seating ourselves upon some large blocks of pumice, we lit our pipes and waited until we could obtain a better view. One thing was certain, this was evidently the volcano of the Öskjagjá which had wrought so much devastation in the Jökuldalr and its vicinity, and we were upon the eastern wall of its crater! Presently the clouds lifted in the distance, and as gap after gap, and space after space cleared, we could see the scorched and blasted country which stretched for many a league behind

us. Mountain after mountain gradually shook off the clouds in which the night had enfolded them, and as the mist cleared toward the north we could distinguish a three-cornered plain, encircled except at one point, N.N.E., by semi-detached sections of volcanic mountains, some of which had broken out in ancient times, and by their insignificant lava streams had helped to swell the widely-extending lava stream of the Ódáðahraun.

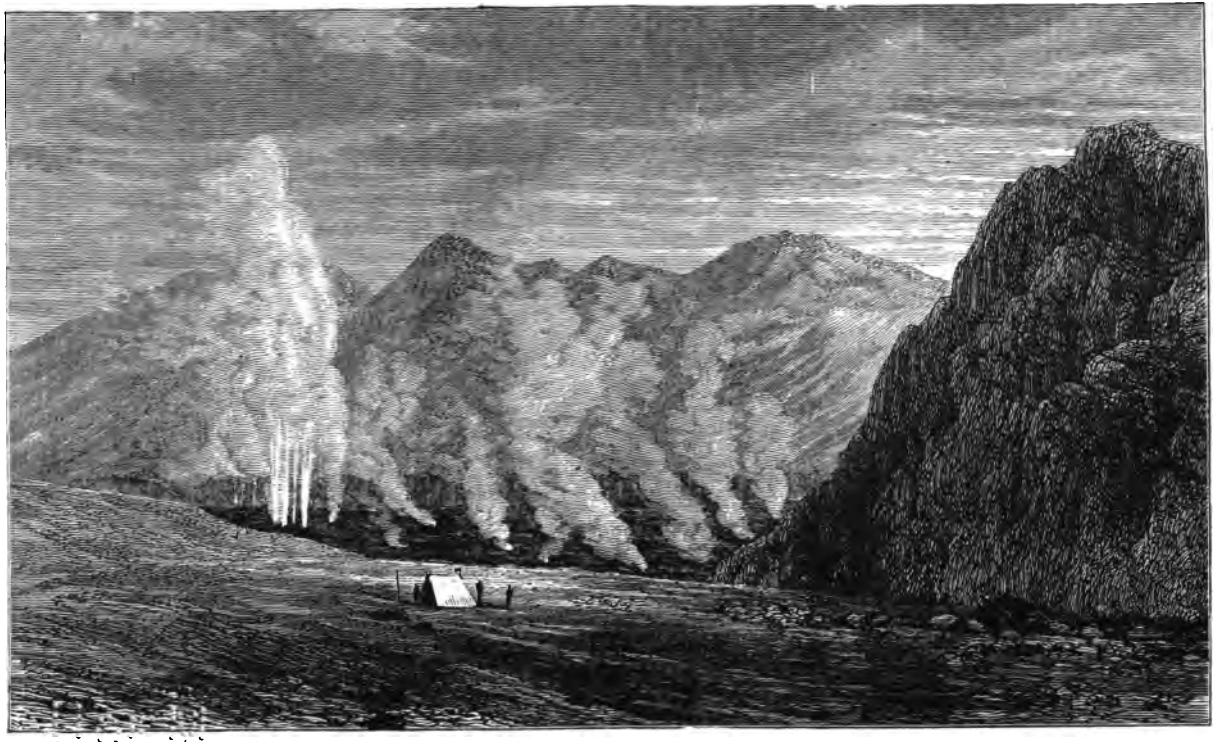
The crater upon the eastern edge of which we stood was situated in its southern corner. This plain was the Askja (or oval wooden casket). It is about six miles long, and from three to four broad, and at this end was some 4000 feet above sea level. I believe it could be easily reached by a glen upon the N.E. side of the Dyngjufjöll. Presently, apparently about a mile away to the north, we could see the rim of the crater, at a great depth beneath us, and while we were looking at it, a great crack opened upon the margin, and a huge slice slipped with but little noise into the crater, deep down beyond the range of vision. The mist, however, somewhat cleared away, and then a shaft, like the mouth of a large coal-pit, was disclosed to the N.N.E. corner of the valley, but beyond the rim of the crater, from which a straight column of pitch-black vapour was issuing. Boom, boom, from its hoarse black throat, was succeeded in

a few seconds by a heavy shower of the coarse earthy granules before mentioned; then a long line of chasms and holes burst to view in the dark floor of the crater, from which issued screaming noises, intermingled with inky vapour, patches of steaming ground, and gaping rifts and chasms. The sun now broke through, and almost simultaneously the clouds lifted from the valley, shaking off the Plutonic vapours which had chained them during the night, and, as if ashamed to own their temporary bondage in the presence of the lord of day, they slunk away to windward. By this time we could see the whole of the crater and its surroundings, except in places where the thick smoke and steam intervened. I felt it was well worth taking the journey from England to stand even for a moment and look into the abyss which opened at our feet, with its black pits and grim chasms all contributing to the general aggregate of steam, and loam, and stench, and horrid sound; while behind us stretched a wild waste of glen, desert, and mountain, a country moaning in ashes, and howling with desolation.

This crater, which perhaps we may be allowed to call Öskjagjá, or "the chasm of the oval casket," is triangular in shape, and is about five miles in circumference, the base of the triangle being to the N.W., and about 1¼ English miles across.

From this base, which was nearly at the level of the plain of Askja, a perpendicular wall of rock cut off all communication with the floor of the crater, which sloped gradually towards the centre, to the depth probably of four or five hundred feet below the plain above described; but I had no opportunity of measuring it, as I could not get down to the crater at any point, neither could I see nor hear the stones which I flung in strike the bottom, as they gave back no sound, on account of the soft mud into which they must have fallen; for the floor of the crater appeared to be covered with the same soft loam which was at intervals rained upon us.

The eastern and western sides of the crater converged towards the south, being shut in by lofty mountains, which rose in some places to the height of 1000 feet above the plain of Askja; so that they appeared to be shorn of their inner faces by the violence of the eruption, which had left perpendicular cliffs of great height. The edges of the crater, too, were rapidly tumbling in, and had formed in several places steep slopes of pumice and débris, which it was quite possible to descend; all access to the floor of the crater, however, was prevented by an interior rim of precipice immediately at the bottom of these heights. How long this shape will remain unaltered is, however, a matter of great doubt, for during our stay there,



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sometimes scarcely a minute elapsed between the roar of the stony avalanches, which increased the din and gradually altered the form of the crater! Three principal lines of fissures, pits, and irregular openings diverged from the centre of the crater to the south-east and west respectively. These, together with black patches of steaming ground and several minor cracks, were all that remained of the huge chasm which at one time must have occupied this valley.

I now selected a spot where there had been a considerable fall in the wall of the crater, forming a slope of a much smaller angle than anywhere else, and exposed a stratum of the previous winter's snow which enabled us to obtain sufficient water for our breakfast.

My men slept here while I posted up my diary, but I was presently disturbed by a peculiar rushing sound. I instinctively looked towards the crater, and there saw what at first sight seemed to be a fog-bow amongst the steam, but presently the increasing noise gave sufficient evidence of its true character. It was a huge column of water springing up from a fissure in the bottom of the crater, which, being ejected in a slanting direction, almost described an arc, rising to a much greater height than even the level of the spot we were encamped upon, was, of course, con-

verted into spray long before it reached such an elevation, and falling with great violence upon the opposite edge of the valley, caused a great portion of the wall of the crater at that point to fall away with a prodigious noise, the concussion of which produced a series of avalanches in various other parts of the volcano. One could imagine, from the effect of such a comparatively small body of water, what a terrible scene must have presented itself when the mountain was in a state of general activity, and when the entire crater vomited a vast volume of pumice, mud, and water, and the whole valley beneath was a seething cauldron of fire and water! We next removed to the lee of a large rock of agglomerate, and having scooped a bed in the pumice, slept comfortably, with the tent spread over all of us like one large blanket.

Upon awaking I ascended the highest point in the wall of the crater, which was almost its southern extremity, and there I found its height by my aneroid to be about 4500 feet above sea level, the angles by my azimuth compass being from Herðubreið 40° west, Skjaldbreið 103° east. From this point the floor of the crater appeared more bent about and upheaved, while many of its gaping fissures seemed much wider than before, doubtless the result of the longitudinal view of them which the position commanded; in fact, each fissure seemed trying to excel its neighbour in

making the most horrible noise, while emitting the most nauseous smell. I doubt if even Cologne, in all its former nastiness and "thousand well defined and separate stinks," could have produced anything so utterly putrid and abominable as the effluvia which were wafted to the summit we were standing upon! At one point it seemed just possible for us to reach the floor of the crater, and as it would save us a considerable detour if we were able to cross it, we packed up and began again to descend a very precipitous slope of pumice. From thence we descended as far as 750 feet, and then found our way barred by the interior rim of precipice before spoken of. Hitherto we had been unable to see its full extent from the overhanging wall of the crater, but from this vantage-ground it seemed to be about 300 feet deep, while the floor appeared to be dark mud: many of the fissures must have been twenty or thirty feet across, and others at least a quarter of a mile in length. I tried to measure the precipice by flinging over a large lump of the heaviest pumice, but it gave no sound as it reached the bottom, for it was so light I could not fling it far enough to see where it struck, hence we were afraid to go to the extreme edge of the precipice on account of the loose and crumbling nature of the rocks. Nothing now remained for us but to climb back again. This was

no easy matter, because of the great angle of the slope, so I was compelled to dig my sore toes into the pumice with all my might; and in one place, for a distance of some 200 feet, to dig steps with my ice axe. We reached the summit at last, very warm, but very glad to be at the top instead of at the bottom of those 750 feet, for had we slipped, we should in all probability have fallen to the bottom of the crater. At last we arrived at the plain of Askja by following along the top of cliffs upon the eastern side of the crater, and there we found everything covered with a dark brown loam, which was still falling thickly around us. I next inspected the pit I had noticed in the morning, which was situated by itself at the top of the precipice, and found it about a quarter of a mile in circumference. Upon looking into it, for a long time nothing could be seen but dense clouds of steam and loam which were rising from it with intermittent violence; but after a while a large portion of the margin slipped in, and stopping the steam for a few moments, enabled us to discern a black funnel-shaped pit tapering towards the bottom, from which huge volumes of steam were again begining to rise; then came a sudden burst of hot steam, loam, and stench, which again compelled us to make a precipitate retreat. I next investigated every part of this side of the crater in order to see if

I could by any means descend to the floor of it, but I found the interior precipice extended all round, and at every point prevented my doing so. We therefore camped but a short distance from the pit, that we might be the better able to watch the wonderful and varying manœuvres which from time to time were enacted.

The worst of our position now was, that it lacked both snow and water, but the loam made us a tolerably nice soft bed, and we slept soundly. Soon, however, a heavy fall of loam upon our tent awoke us, and our eccentric friend outside was uttering such fiendish noises, and giving off such a putrid stench, that we thought the better part of valour was to retreat; so we hastily packed up amid a copious shower of loam, our movements being quickened by the surmise that we might also be treated to a little pumice and hot water. Moreover, the stench was beginning to tell upon us, causing us to feel sick. We next proceeded along the N.N.W. side of the crater, as I wished to count the number of paces along it, in order that I might approximate the size, which I found to be about one and a quarter miles in length. The ground was now much fissured, and disclosed in many places the snow of the previous winter at the depth of six feet beneath the pumice, as well as a quantity of loam which had been flung

out by the volcano. After breakfasting beside one of these fissures, at mid-day we turned our backs upon what I can imagine to be one of the most marvellous, and perhaps I may add, one of the most indescribable sights the world can anywhere present! On resuming our journey, we set our faces towards Skjaldbreið, alias Trölladyngjá, and the first part of our journey was across the little plain of Askja, over a lava stream, which here enters from the Ódáðahraun, and had run for some distance up hill. The loam which had been showered down by Öskjugjá had taken the edge off the lava, which was a great source of comfort, and soon we were glad to sight the broad black desert of the Ódáðahraun. There was the snowy mound of Skjaldbreið, spotted with black lava, with its curious tuft of rock at the top, somewhat similar to that on Herðubreið. Before us there was Kistufell, by which we had first descended into Norðurland, and behind all, the broad expanse of the Vatna Jökull, sweeping the horizon from east to west, where it appeared in the distance to be joined by Tungufell and Tindafells Jökull. From here, we could not see the Sprengi Sandr, which lay between them, but perceiving through my telescope a patch of snow upon the hills which almost joined Skjaldbreið upon the east, I determined to strike a line across the

Ódáðahraun to it, that I might take another rest and relinquish all our loads before we ascended Skjaldbreið the next morning.

I may here remark that the Ódáðahraun is a desert of sand and lava, extending over an area of 1200 square miles, the greater part of which seems to have flowed from Skjaldbreið, so I think it must be one of the oldest lava flows in Iceland, for this volcano has not erupted since 1305. Some of the lava may, however, have flowed from the Dyngjufjöll, or, possibly, from fissures in the plain itself. I could, however, trace no distinct stream from the above-named mountains, nor has any one, I believe, travelled along the west side of them for the purpose of ascertaining. In several places the lava of the Ódáðahraun has run up hill. This, I believe, has been occasioned by the crust which flowed upon the surface of the lava stream, constituting a sort of pipe with the ground upon which the stream rested; and the air being thus excluded, the still liquid lava underneath has acted in the same way as water would when enclosed in a pipe, by finding its own level, or approximately so, according to its degree of fluidity. At any rate it took us five hours to cross the Ódáðahraun and reach the snow patch I had seen. There we rested, and early next morning, accompanied by Thorlákur, I set off for

Skjaldbreið, leaving Eyólfur, who was very tired, in camp. We next followed an immense lava stream about half-way up the mountain, and during the early part of our walk I several times heard the muffled sound of water running beneath the lava. When about half-way up, we reached deep indurated snow, through which protruded the black hummocks and masses giving Skjaldbreið such a mottled appearance when I first saw it from the Dyngjufjoll mountains. Skjaldbreið is, however, nothing but a huge mound of basaltic lava, partially covered with snow, rising by a very gradual slope to about 4000 feet above sea level, and from it has evidently flowed the greater part of the Ódáðahraun, though, as all the neighbouring mountains seem to have erupted at some period or another, it is but fair to presume they have also helped to swell this vast wilderness of volcanic dregs; but I have been unable to trace any lava stream in the Ódáðahraun to any other source than Skjaldbreið. The summit of Skjaldbreið I found was thickly enveloped in clouds, so I stopped when within 300 feet of the top to look at the surrounding country. To our north lay the arid waste of the Ódáðahraun, the unearthly desolation of which I have never seen equalled. Truly, it may be said that it extends over but a small area when compared with many of the mighty deserts in

other parts of the world, but there is a forbidding, yet fascinating grimness about this which is an especial characteristic of Icelandic scenery, and as this savage region extends as far as the eye can see, it produces none the less vivid impression upon the mind of the beholder, although one can refer to the map and find that it extends over only about 1500 square miles. When first gazing at a dreary Icelandic lava desert the sensations are something akin to those experienced when for the first time one sees a prairie immediately after the fire has swept across it; but although one is conscious that there may be a million instead of a thousand square miles of burnt, black, cindery country around, it does not impress one with its awful magnificence and grandeur of desolation as the Ódáðahraun does. To the north and east were the Dyngjufjöll mountains, with their volcanoes smoking away with renewed vigour in the cold morning air. A point further to the east was the long weary route we had just traversed, stretching away bleak and bare to where the grey pumice in the distance gave the country the appearance of lying in bright sunshine. To the south rose the Vatna Jökull, cold and gloomy, with its heights wrapped in fog and mist. Kverkfjall and Kistufell, however, were exceptionally clear; the former was smoking in three places, and a great quantity of sand and lava

appeared to have proceeded from it. Between us and the Kverkfjall swept the broad tongue of glacier, reaching two-thirds of the way northward towards the Vaðalda hills, and from its extremity I counted five arms of the Jökulsá which issued from it, while the small stream from Kistufell was hidden by the intervening hills. We next continued our journey to the summit, and then found a small but perfectly formed crater, about 500 yards in circumference, but of no great depth, while in the centre rose a ridge of burnt lava, which gave the mountain the black tufted appearance I had noticed in the distance.

The latest eruptions, I should imagine, from the contour and disposition of the surrounding lava, have taken more the form of prodigious boilings over than of explosive outbursts, and it seems as if it had continued to burn tranquilly long after its last outburst. From here we descended a short distance upon the north-west side, in order to get below the fog, and obtain a view of the country to the west. The same dreary desolation presented itself—the pure white Jökull, with the black sand and the rugged lava fields were alike cold, silent, motionless, and dead! The mountains were a little different in form, but there was the same grand desolate wilderness, seeming ready to blast every living thing that dared to intrude on its enchanted solitude. We therefore

returned to camp, and were not sorry to sit down to a good breakfast of pemmican, bread and butter, and water. The sun shone fiercely at midday, and the heat, radiated by the sand and lava, became so great that we rested till the cool of the evening, when we struck for the south-east end of the Dyngjufjöll, which we reached about midnight, but as a thick fog descended upon us, I steered close along the base of the mountains, preferring a little circuit to wandering about all night in uncertainty upon the plain. Our course from here was over an old lava stream, buried in light volcanic dust, which was very trying to travel over, for we sunk rather deeply into it, and had to stop every now and then to empty our shoes, which were constantly becoming filled with sand. At length we struck upon the pumice, which showed we were nearing the volcano of Öskjugjá; soon after we came to a small stream, and being all very thirsty, the water was highly appreciated. Seeing that the pumice increased, and fearing we should be getting too far to the east, I resolved to follow the course of the next stream, conjecturing that it would bring us down to the pools by which we had made our cache. It was a crooked way, but it brought us right at last; for as the mist dispersed we sighted the pools, and it was not long before we gladly lighted upon our cache. The first thing that

came to hand was a box of Fry's chocolate powder, so we all sat down upon our packs and with our broad knife blades began to operate upon the powdery treasure. Eating chocolate powder we found was thirsty work, so having emptied the box, we took a good drink of water, pitched the tent, and turned in.

We had hitherto been using stones for tent pegs, but here there were none to be had, and as we could not now avail ourselves of little screws of hay, as we had done when last camped upon the same spot, we took off our mocassins and buried them, with a string attached to each, at intervals round the tent; these answered the purpose of pegs very well, and as it is always necessary to bury untanned mocassins while resting, to prevent them from shrinking and becoming too hard to wear, we, by this device, managed to "kill two birds with one stone." After a good sleep, I debated on the possibility of reaching the Kverkfjall, which I particularly wished to examine, but the Jökulsá and a long stretch of country lay between us, and as Thorlákur assured me if we did so we should have soon "*to go on our naked meat,*" it was a matter for grave consideration what was best to do. The lava had already played sad havoc with our footgear—we had each of us worn out four pairs of mocassins since we left Grímstaðir—and those which were doing duty as tent pegs were almost played out,

while there were but two pairs remaining in our small stores, which was anything but encouraging. Moreover, we had a long way before us yet; so all things considered, I came to the conclusion that Kverkfjall was impracticable. I determined, therefore, to ascend the Dyngjufjöll again, and from the peak above us take a farewell look around, directing Eyólfur in the mean time to carry all our things to a small stream at the foot of the mountains, about two miles north of our present position, which could be easily done in two shifts. Accordingly, I began my climb accompanied by Thorlákur, but our progress was continually interrupted by deep "gjás," or fissures, many of which were of great depth, probably several hundred feet. In some cases, however, we found bridges of snow and pumice, by which we were able to cross these chasms.

At this time the sun was wending its way westward across the snowy slopes of the Vatna, as we reached the top of this part of the Dyngjufjöll, and really language quite fails me when I attempt to describe the wildness of that view! Behind us was the volcano, from which vast volumes of dark smoke and steam were rising; the various mountains which studded the sterile wastes before us were all clothed in the same dull grey covering; the black sand of the Mývatns Örœfí was just visible to the north,

and as far as the eye could see eastward, there stretched a series of mountains, valleys and wasted plains. During nearly two hours we might almost be said to have slept in the view before us; indeed, I was hardly conscious how the time had gone until the sun seemed to have slipped behind the Hofs Jökulls, giving their snows a golden outline, while my watch reminded me that it was nearly 11 P.M.

The atmosphere now turned very cold, the frost was already sparkling upon the surrounding rocks, a purple glow stole over the mountains, blending their softened outlines with the tinted sky, and we felt that a little brisk work would sensibly add to our comfort. Our descent afforded us some amusement, sliding down the steep beds of small pumice, which we did at a furious rate. It had taken us more than three hours to ascend the mountain, but less than one to come down it! We found Eyólfur where I had directed him to wait; making a good meal, we patched up our mocassins as well as we could by moonlight, and by a different route to that by which we came we struck a straight line for Herðubreið. Ultimately we reached Herðubreið with the sun, and I was not at all sorry to find myself on my way home; for increased inflammatory symptoms in my great toe showed that a liberal application of blue-stone and rest were absolutely indispensable to its

cure. The weather by this time appeared very uncertain, for the heavens were spotted all over with masses of golden nimbus, drifting rapidly before a wind which was blowing above, though the atmosphere beneath was perfectly calm, which are invariably indications of storm in Iceland.

We were now clear of the pumice, and after a hard scramble over some very rough lava, part of which had flowed from an ancient volcano not marked upon the map, about eight miles S.S.E. of Herðubreið, part, apparently, from the Dyngjufjöll mountains, and some from Trolladýngjur (Troll's bowers). Here we camped by a pool of water.

Herðubreið, whose trigonometrical height is 5447 feet, is a snow-covered cone, resting upon a perpendicular mass of rock, whose height equals about twice the diameter of the cone. Upon its south-east and west sides are tali of disintegrated and greatly weather-worn rocks, and bulging, misshapen masses of agglomerate. At every point except the S.E. and N.N.W. the sides are perfectly perpendicular, presenting walls of about 2000 feet from the base of the mountain to the commencement of the snow-covered cone; it is surrounded by a dry sandy foss, and choked in places with rounded *débris*, which had fallen from the agglomerate of which Herðubreið is principally composed.

Probably the most remarkable feature of this mountain is that no streams of water flow down its sides, while the base of most other Icelandic snow-capped mountains are generally watered with streams, which, as we have already seen, often disappear in sandy or cavernous ground; but here all the water which must result from the melting of the frozen accumulation upon the summit of Herðubreið seemed utterly lost, until it issued in springs such as those which form the source of the Lindá, at a considerable distance from the base of the mountain, or collects in pools such as Herðubreiðvatn.

The gulleys which had in many places worn the side of Herðubreið into the fantastic forms so peculiar to this formation (agglomerate), appear to be the result of rain and wind, and the only points from which the mountain is assailable are the S.S.E. and N.W. It was from the latter that Captain Burton attempted it in 1872, and that experienced traveller seems to regard it as the core of a much larger mountain; possibly such may be the case, but its shape is decidedly against its being a volcano of anything but the most ancient order. History tells us, however, that this mountain has erupted upon several occasions. The eccentricity of its form is sufficient to suggest any amount of speculations as to its origin and character, while nothing

but a careful investigation of the mountain from the base to the apex could enable anyone to arrive at a satisfactory conclusion. The palagonitic agglomerate (which, as I have said, constitutes the greater part of the mountain), is of so friable a nature, and so rapid is the erosive influence of the Icelandic climate, while so disturbed and metamorphosed has the whole of the island been by volcanic agency, that one ceases to wonder at the eccentric shape and anomalous character of its mountains.

I much regretted being compelled to pass by Herðubreið without attempting to ascend it, but our foot gear was in tatters and my sore toe required immediate attention, so we camped in a large gulley of sand and lava, which extended a mile or more, gradually rising to the level of the plain towards the south. Here, while we were lying with the tent spread over us all, blanket fashion, and had just dropped off to sleep, we were suddenly awakened by such a blast of wind, and a deluge of the finest sand and pumice, that for the moment I did'nt know what it was. At first we started to our feet, only to get our eyes full of finely-powdered pumice, and as I tried to speak I got my mouth full. We saw all the smaller articles of our packs making the most speedy tracks for the more settled portions of the country. I tried to save my hat, but in so doing kicked

my bad toe against a lava block, tangled my feet up in the tent rope, and fell down, the latter being about the most sensible thing I could do, for in a few moments the gust was past and I could look up.

Blind with the sand, and wild with the agony it was occasioning us, we all rushed for the water, and opened our eyes in it. While so doing there came another gust, which compelled us to wait upon our knees, keeping our heads in the shallow water until it was over; and then, soaked with sand and water, we made our way back to where our things had been. I say *had been*, for all were not there then; my broad-brimmed Danish hat, and half my small etceteras were gone, and, worst of all, my map and case, where were they? Four white spots upon a lava field a quarter of a mile away caused me to run—yes, run—bad toe and all! However, my painful and spasmodic effort was amply repaid by the recovery of Olsen's map, which had been nicely mounted and packed up in a case by the bookbinder at Reykjavík; now, even the bookbinder would scarcely have recognised it. Its journey across the Vatna Jökull had not improved its "personnel," but the short cut it had made through the neighbouring pool had in some places rendered it illegible. Fortunately the Vatna Jökull and its surroundings, with my various markings, were miraculously preserved, but its case I never saw again.

To return to camp. Everything that had been buried in the sand had been dug out, and just as we were about to start again another gust came sweeping down the gulley, half smothering us. We buried our faces in our mackintosh coats until it was past, when my companion Thorlákur remarked, "This is not fine;" to which I assented in the most emphatic language my stock of Icelandic would command. We now made very fair progress over the lava field, where, under an overhanging lava block, we bathed our eyes with sulphate of zinc and rose water, which had often been a great relief during my Icelandic journeys, and I advise all travellers who may follow in my wake by no means to omit taking so essential a medicament. We soon reached the grass at the source of the Lindá, which river rises from a single spring about two miles N.N.E. of Herðubreið. Here we took the rest we had been unable to obtain at our last halting-place, and by evening we reached the remainder of our party at the Grafalandá, where I was rejoiced to find our horses and a good supply of provisions, which had been sent with a kind note from the good people of Grímstaðir, who had sent us some pancakes, flat bread, coffee and milk, and the latter, though sour, was very acceptable. From Vopnafjörd I also had ordered some schnapps and chocolate; so

that we made what seemed to us a right royal feed, and after a good wash, I enjoyed a night of sound rest in the sleeping bag, which had previously sheltered my men who had been waiting for us upon the banks of the Grafalandá.

At 5 A.M. the next morning we were on horseback, and away over the sand and the lava of Mývatns Örœfí, leaving the Vatna Jökull and the land of the outlaws behind us, enveloped in clouds of light grey dust which were blown up from the pumice by a S.E. wind. This dust, I must explain, was of the most irritating nature, resembling finely-powdered glass; our clothes got saturated with it, and I was already beginning to feel its effect in the severe abrasion of skin it was inflicting upon me. By 12 A.M. we were level with Grímstaðir, only much more to the west, and here we stopped to allow the horses to graze off the wild oats, for the heat of the sun was intense. After lunch we must all have taken a nap, for suddenly looking up, I found it was one o'clock, and the horses were nowhere in sight, and more than an hour elapsed before we recovered them. Having secured the vagrant animals, we made for the new lava, which was produced by the eruptions of last spring in the Mývatns Örœfí. Sulphurous and acid vapours had long announced its proximity, although the wind was unfavourable for their reaching so far.

This lava stream, which is about fifteen miles long, and varies from one to three broad, has flowed almost entirely over ancient lava streams, most of which have flowed from an old crater situated in the vicinity, called Sveinagjá. The new lava extended to about an English mile to the north of the old road from Reykjahlaíð to Grímstaðir.

At this particular point it is bordered by a rather fertile stretch of ground, where a few sheep managed to sustain a miserable existence on cinders and salix, though further to the north and east there are excellent pastures. The lava stream was basaltic, and presented the usual chaos of black crags, waves, and fanciful shapes, blisters, and heaps of clinker. It was intensely black, and still hot; thin, pungent choking fumes being emitted in all directions, while from various places puffs of steam were constantly bursting out. This stream, or rather, these two streams, which have since joined one another, I find have flowed from a long fissure in the plain, the course of which was marked by a line of conical mounds thrown up by the eruptions in the late spring; of these a fuller description will be found upon another page, and an account of the previous eruption in the Appendix.

We climbed a few hundred yards over the lava stream, but could not reach the mounds from which

the lava had flowed, on account of the deleterious fumes exhaled from them. The fissures were lined with various sublimations, to the thickness in some places of half-an-inch. Amongst them chloride of ammonia was very prominent, but this was in a state of rapid deliquescence. It might have paid to collect it, for the quantity was considerable.

We next turned more than a mile out of our course, to a part where Thorlákur expected to find some water, for we were all very thirsty. Our road, however, was over old and viscous lava for some distance, and we came upon some coarse hillocky grass land, in a line north of the lava stream. Here we encountered a variety of fissures which had been formed by the earthquake, several of which, Thorlákur informed me, had cast out sand, stones, and a little lava. We found only dry pits at the place where Thorlákur had expected water, so nothing remained but to strike westward for Reykjahlaíð. No doubt the various cracks and fissures so recently formed in the plain accounted for the absence of water.

The new lava obliges a traveller from Grímstaðir to Reykjahlaíð to go three miles out of his way. We here crossed a depression of about thirty feet, extending over several square miles, caused by the late volcanic disturbances. In the vicinity of this

depression the ground was upheaved and much fissured. Thorlákur informed me that the depression was formed shortly after the first eruption in the Mývatn Orœfi in the preceding spring. We were, however, soon amongst the hills of Mývatn, where we obtained some water, and before long ascended the Námufjall, whose dirty yellow, red and brown sides, had in some places the appearance of washed-out posters. Here the smell was filthy. In this locality the treasures of the Northern Sulphur Mining Company are situated, but as I was thinking more about my supper than the hidden wealth of the hills over which we were riding, I will say more about them presently.

A wady near the summit which divides the Námufjall upon the south from the Dalfjall upon the west, brought us to the western side of the sulphur hills, where we first caught sight of the Lake of Mývatn, or Midge-water, upon the north end of which Reykjahlaíð is situated. Lake Mývatn is seen to the best advantage at a distance, but it cannot lay claim to great beauty of appearance, although certainly both remarkable and interesting. Surrounded as it is with volcanic mountains, and rugged lava streams stretching along its shores, studded with misshapen little islands, it presents an eccentric and striking aspect. A short ride past spluttering and steaming

solfataras brought us to the farm of Reykjahlaíð, where we were hospitably received by the bóndi Pètur Jónsson, who was expecting our arrival.

Reykjahlaið is of the average better class of byre. The farm is a good one, and has been in the possession of the same family for 600 years. I was glad to find Paul and the rest of my belongings awaiting us, and anything but displeased to receive the information that an Englishman occupied the guest chamber. My compatriot I found to be Mr. G. Fitzroy Cole, who was making a survey of the neighbourhood for the Company purposing to work these northern sulphur mines. I also heard that a sulphur prospecting party, under the guidance of the well-known Captain Burton, had only just left for Húsavík, upon the sea coast. The guest chamber being thus occupied, I shared another room with Paul and Thorlákur, and in the morning I had the pleasure of making Mr. Cole's acquaintance, sharing the guest room with him, and likewise a magnificent salmon.

The two days following I rested, as the weather was so unfavourable. I also paid off all my men excepting Paul and Olgi, and sent them home to the south. Mr. Cole in the meantime left, so I proceeded to investigate the sulphur mines for myself. These I found to be situated in the Námufjall, upon the eastern side of the Lake of Mývatn, and these col-

lectively are designated the Hlíðar-Námur; they consist of a series of solfataras, which occur not only upon the Námufjall itself, but extend a considerable distance upon either base of the mountains. The Námufjall is composed of palagonitic agglomerate and lava, the solfataras being simply pools of calcareo-siliceous mud, formed by the decomposition of the lava and agglomerate. Upon the surface of these pools the sulphur sublimates in crusts varying from half-an-inch to several feet in thickness. The phenomena of solfataras are so well known that it is needless for me to dilate upon them in the abstract. However, I first examined the west side of the Námufjall, where I found both active and latent fumeroles, the former spluttering and fizzing, and tranquilly steaming, the latter in the form of cold accumulations of sulphur, siliceous clay and gypseous earth. I was able to follow the tracks of the sulphur exploring party, who had preceded me. They had dug into the sulphur crust upon the surface of the solfataras, and in some places had excavated the calcareo-siliceous clay, which hardens into a species of sinter. This clay likewise contains a per centage of sulphur; at all events the specimens I obtained varied from 5 to 40 per cent. In many places I found crusts of sulphur covered over with light *débris*, which a little digging showed to extend for a considerable distance. Roughly estimating it by

stepping the length and breadth of the various conspicuous sulphur patches, and lumping the smaller ones together, gave about twenty sulphur-covered spots of twenty square yards, upon which the crust of pure sulphur averaged probably half a foot in thickness. On ascending the Námufjall by a deep gulley worn by the rain in the side of the mountain, we found this gulley to be cut through several feet of a friable arenaceous agglomerate, formed by atmospheric action on the disintegrated constituents of the rocks composing the Námufjall. Passing various patches of steaming sulphur, we reached the summit, where we found several solfataras which bear perhaps the thickest deposits of sulphur, though, in the aggregate I should hardly think they extend over so large an area as those upon the western side of the mountain. This mountain is capped by several castellated masses of basaltic lava, much weather-worn and decomposed by the acid vapours evolved from the surrounding solfataras, which upon eastern slope are decidedly the most extensive to be met with, and I imagine they contain more pure sulphur than either the summit or the western side. Of course when speaking of the relative amount of sulphur, I allude to the exposed crusts, and there must be a great deal more sulphur than appears upon the surface.

Upon the east base were circular pools of bluish

boiling slush, which emitted a fœtid smell somewhat resembling the effluvia which so disgusted us at the Öskjugjá. These pools boil with great but intermittent violence, sometimes splashing the scalding mud to the distance of four or five feet. They have surrounded themselves with walls of hardened mud a few feet in height, and from a breach in two of these walls I should imagine that these springs were occasionally subject to paroxysms of extraordinary violence. While approaching the most northern of these slush cauldrons, the earth on which I was walking gave way, and I slipped into a fissure up to my armpits; a violent burst of steam from beneath me was the immediate result, and I was glad to be extricated from this unenviable position by my companion Olgi. It was indeed fortunate the fissure was not filled with boiling slush, or I might have been scalded even more severely than was my travelling companion, the Rev. J. W——, in 1874, in the solfataras of Krísuvík, in the south of Iceland. This fissure had probably been formed by the earthquakes in the Spring, and had at one time been filled with slush, which had hardened on the surface, and afterwards flowed away through some other channel, leaving a treacherous pitfall for any unlucky tourist who, like myself, should have a fancy to closely examine these slush pools.

On returning to the west side of the mountain, and on my way to Reykjahlíð, I took the liberty of scraping off all the sulphur from a small solfatara, which I piled in a heap by the side of it; for the grand question for the Sulphur Company to consider, to my mind, appears to be—how long does this sulphur take to accumulate? I trust Mr. Locke, the owner of these mines, will forgive me the trespass; but in a year's time he will be able to form some idea of the rate of accumulation. I shall feel curious to know how soon the sulphur will again accumulate.

We next returned to Reykjahlíð and supped with the bóndi Pètur Jónsson, his son-in-law, Thorlákur, and Paul. The former seemed a little aggrieved at the sulphur business generally, and from what I could gather, it had from time immemorial been a sore point as to whether the sulphur mines belonged to his family or to the Danish Government. There could not be the slightest doubt about the matter, but I could scarcely wonder at the existence of such a feeling; for a family who had owned the neighbouring country for 600 years might naturally think the intervening mountains were their own fee simple. This feeling quite accounts for any brusquerie the Sulphur Prospecting Expedition may have met with. I can only bear testimony, that during my stay at Reykjahlíð I received the kindest attention, that I

had the best of everything there was in the place, and that the charges were moderate. Old Pètur informed me that he was building a stone church in place of the old turf and wooden structure, which required repair. He had plenty of stone, but his chief difficulty was the want of lime; in fact, he had been obliged to import all he had hitherto used from Denmark, which of course was very expensive to him; so I advised him to try and burn the gypsum from the solfataras, and instructed him how to set about it, which piece of information seemed to rejoice his heart exceedingly.

The old church in question is the veritable building, with some additions and improvements, concerning the escape of which from destruction during the eruption of some craters to the S.W. of Krafla, in 1720, so much has been said and written. Suffice it to say, that the lava could not have reached the church unless it had previously filled up the Lake of Mývatn. My day's work ended with making preparations for a visit to Dettifoss.

The morrow brought very unsatisfactory weather; it had snowed heavily in the night, and the mountains and ground were white, a piercing north-west wind was blowing, and it seemed as if we had suddenly jumped into mid-winter; however, by nine o'clock we were on horseback. As we journeyed on

we were much amused and surprised to see hay-making going on in the middle of a snow storm; but still it was the fact that the good people of Reykja-hlíð were busily engaged in the tún (home field) mowing grass, and piling that which had been cut a day or so previously into cocks, that it might receive as little injury as possible. Leaving Reykja-hlíð behind, we crossed the rugged lava at the west base of the Námufjall, and ascended the winding path of the Námu-skarð, which divides the Namu-fjall from the Dalfjall, and turning to the north pursued our way by the side of an ancient lava stream, covered with verdure, and thence bending sharply to the north-east we reached the little bothy of Skarð-sel, a poor dilapidated hut of turf and lava blocks, which sheltered some of the servants from Reykja-hlíð, who during the summer months tend the sheep in the neighbouring grass land. Here we took a good draught of milk, and leaving behind us a large piece of Mr. Cole's salmon, some hard tack, choco-late and schnapps, to refresh us upon our return, we crossed the Sandbalnafjöll by means of a sandy pass, and reached the plain of the Mývatns Örœfí amid a blinding storm. Our route lay again over lava, covered with sand, which I was informed had been ejected by Krafla. On, on, N.N.E., the storm utterly defying our tattered mackintoshes. A little

herbage had begun to make its appearance, and presently we were galloping over excellent sheep pastures, varied occasionally by barren stretches of sand and pebbles. Several times, however, we were stopped by fissures which had been very recently formed in the plain, probably by the volcanic action of the previous spring, but very insignificant in comparison with those we had previously met with in the Mývatns Örœfí. At last, after about six hours' riding, we sighted the column of spray arising from the Dettifoss, and soon after we descended into what appeared to have been the bed of a large river, most likely an ancient bed of the Jökulsá, which may have been diverted to its present channel by an earthquake; while upon ascending its eastern bank, the dull roar of the Dettifoss reached us. Climbing over crags of basalt we rode to the edge of the river, where we dismounted upon a patch of excellent grass, and thence obtained a good view of the cataract, which is very imposing. The Jökulsá is here about 250 yards across, and roars along in a series of rapids, till its broken and foaming waters pour down a perpendicular wall of basalt at least 200 feet in height, into a chasm some hundred yards wide, seething and boiling in pent-up wrath, forming a "riotous confluence of water-courses, blanching and bellowing in the hollow of it," until, released

from this confinement, it softens, a few hundred yards further down, into a broad swift-flowing stream of milky water. The Dettifoss is by far the largest waterfall in Iceland, and, I believe, in Europe, being about the size of the Canadian Niagara Fall. The only view obtainable, however, is not calculated to impress the beholder with an adequate idea of its height, for one has to look down upon it, which is always a disadvantage: still, although the Dettifoss lacks the beauty of Niagara, it does not convey the impression of the thinness of the body of water, as does the Transatlantic cataract; for the grace and beauty of the latter are greatly enhanced by its surroundings of richly-wooded heights and the clearness of the water. Although Dettifoss is much smaller than the Falls of Niagara in their entirety, nevertheless, it is a grand and terrible spectacle, and is all the more striking on account of the diablerie of the wild scenery by which it is environed. There is an upper cascade, but of no great height, and it is scarcely worth naming beside Dettifoss; for one waterfall is so much like another, that, after having seen several of the largest, one rather tires of the similarity, unless there be some distinguishing peculiarity to enliven the interest.

When satiated with admiring the scenery at this part, we took a light meal, and commenced our

return journey amid pouring rain. It was past midnight before we reached the west side of Mývatns Öræfí; and as the mist had somewhat lifted from the hills, I turned my horse's head towards Krafla. Upon reaching the height of a few hundred feet the mist again beat down upon us; besides which the snow lay so thick in many places that it became very dangerous for the horses in the half-light and fog. We therefore abandoned Krafla for the moment, and taking the first gill which ran in a southerly direction, we descended to the little hut where we had left our salmon and reserve supply of provisions. The good folks were in bed, but one of the women immediately got up to assist us, and the other produced, first the bottle of schnapps, and then, one by one, the biscuits and the chocolate, from what appeared to be the only cupboard in the place, viz., from underneath the bedclothes. As the bed had three occupants, I was in terror lest my salmon had been stored in the same undesirable repository, but fortunately it had been put up outside. The biscuits and chocolate might have been none the worse for their safe storage, but they were unpleasantly warm, and I preferred to wait for the salmon, which with some good coffee, sheep's milk, and schnapps, was not to be despised by a hungry traveller who had been exposed to the storm for nearly a score of hours.

We reached Reykjahlíð at five A.M., and I turned in for a short sleep, till breakfast at seven o'clock, and then we made our start for Krafla. Over the Námufjall again, by the Námu-skarð, a gill of solfataras, we passed the parti-coloured heaps, slopes, and accumulations, which reminded me of the refuse from some huge dye-works, and turned to the north along the east base of the Dalfjall, skirting a lava stream upon our right hand. Hereabout the aspect was much improved by (for Iceland) a luxuriant overgrowth of dwarf birch and salix. Crossing hence to the base of Sandbalnafjöll, we drew up for a minute at the little hut of Skarðsel for a draught of sheep's milk. Pursuing our way over a lava field covered with alluvium, we hastened on towards Krafla. We hobbled our horses at the base of the high ground between Krafla and Leirhnúkur, and forthwith commenced the ascent, passing several solfataras of no great importance, their chief characteristic being the production of abominable smells. Soon after we reached comparatively level ground, which extended for some distance at the S.S.W. base of Krafla proper. Cheered by the sight of our horses making tracks for home, in spite of their hobbles, we now continued along the south-west margin of a crater-lake, which probably was more than two miles in circumference, its length equalling

about twice its breadth, being surrounded by steep slopes of clay, disintegrated rock and fragmentary *débris*. There was a similar crater further to the N.N.W., of more circular form. Following along a neck of land between the two, we commenced the ascent of Krafla proper, which is a sub-conical mass of agglomerate, pierced to the summit and in many other places with intruded lava. The sides we found to be everywhere strewed with all kinds of volcanic *débris*, amongst which were numerous trachitic masses, some of which contained atoms of iron pyrites, and although these occurred very frequently in loose fragments and masses, I was unable to find any *in situ*. Half-an-hour's hard climbing next brought us to the summit, which my aneroid shewed to be scarcely 3000 feet above Reykjahlíð, or a little under 4000 feet above sea level. On looking around we found upon the high ground to the west several pools of clear water, probably small crater lakes, as doubtless were the two depressions immediately beneath us to the south-west. My guide informed me that it was from the most northern of these that the last eruption of Krafla proceeded, and that the water in it used to be hot; he also told me a fact which was afterwards corroborated by his father, that Krafla had never been known to erupt lava, having cast out only ashes,

pumice, sand and water; indeed, the aspect of these pit craters would lead one so to imagine it. I was also much surprised at not finding any obsidian, for I had heard so much of the obsidian of Krafla; but on further inquiry I ascertained that it is only found on the portion of the mountain known as the Hrafntinnuhryggr (the obsidian back), and there it only occurs in fragments—indeed, the only obsidian I have met with *in situ* in Iceland is at Mount Paul, in the middle of the Vatna Jökull.

The summit of Krafla commands a most extensive view. Looking south-west, over the hills beneath, with their dirty splotches of whitish yellow sulphur, the country looked wintry indeed after the snow storm of the previous day, while the eye as it wandered southward caught a fine view-range over the Hliðarfjall and Dalfjall, as well as over the straggling lake of Mývatn, where the scenery widened out over the Mývatnsveit towards the snow-capped Seljalandsfjall, standing out like an island in the commencement of the dark stony sea of the Odáðahraun. In another direction, between the snow-covered hills upon the east side of the Skjálfandifljót and the smoking Dyngjufjöll, the view extended over the pitiless waste of the Odáðahraun to the snowy mound of Skjaldbreið, while the broad white expanse of the Vatna seemed to join

the sky, till, almost wearied with the strain upon the visual power, it seemed quite a relief to turn to the nearer and happier-looking spots of green which the volcano and the glaciers have spared to Iceland.

Further to the east are the Bláfjall, where the Fremri-Námur deposits of sulphur are situated, and the fire-scorched hills of Trölladyngjur, whose position on the map Captain Burton has corrected, and the lordly Herðubreið, whose snowy cap looked all the purer for the recent snow storm. To the east and north-east stretched the plain of the Mývatns Örœfí, with its black patch of new lava enshrouded in a dim mist. Bearing N.N.E. was a tall column, apparently of steam, upon which the sun was shining; it was the spray from the Dettifoss, varying in shape as the wind acted on it, and reflecting rainbow colours in the sunlight. To the north the prospect was between the Hágaunguhnúkur (high-going hills) and Jónstindr, over a level country to the hills of Theistareykjafjall, where a third large deposit of sulphur occurs. It was seven P.M. before we returned to Reykjahlíð, and in a few hours we bade adieu to old Pètur and started along the eastern side of Lake Mývatn, accompanied by Paul and Arngrimur, for the little lake of Grœnavatn. The road was a bad one, over a continuation of lava

streams which had flowed into the Lake of Mývatn, forming the curious little islands that spotted its sedgy waters. We put to flight several of the duck tribe, which were enjoying themselves after the manner of ducks upon the margin of the lake, and reached Grænavatn at three A.M.; this was very slow work, but the nature of the ground prevented our travelling at anything beyond a walking pace for the greater part of the way. One of the principal features of this ride was the numerous gates which had to be opened and shut; these marked the termination of the various holdings, and also prevented the sheep belonging to the different homesteads upon the side of the lake from straying; for very often, where the gates were situated, the lava prevented the passage even of sheep by any other way.

The occupants of the farm at Grœnavatn may be described as "a happy family." The two sons of Pètur of Reykjahlíð, Jón and Arngrimur, had married the two sisters of my previous guide, Thorlákur, and he, by way of returning the compliment, had married one of their sisters. They were all living under the same roof with Thorlákur's father, and together managed their thriving homestead.

About midday we started for the sulphur mines of Fremri-Námur, on the east and west slopes of the Bláfjall and Hvannfell. Proceeding in a S.S.E.

direction we crossed the lava which occupies the entire eastern side of the valley of Mývatn, and began to ascend the hills at the base of the Bláfjall. We here inspected two small but perfectly-formed craters, both of which had discharged lava streams into the valley beneath. A little further up the hill to the north of the Bláfjall we came upon the tracks of the Sulphur Exploring Expedition, under the conduct of Capt. Burton, who had passed that way a few days previously. From this point the hills commanded a striking view of Mývatn, Krafla, and the neighbouring mountains, with a glimpse to the south-west of Arnarfells Jökull in the far distance. This we found was a difficult route for the horses, and it did not improve as we reached the lava which had flowed from the Fremri-Námur at the the time of its latest eruption. This lava stream had flowed into a valley between the Bláfjall and the Hvannfell, destroying all herbage except a little "island of green," which it almost encircled; this small patch of verdure is called Heilag (holy valley). Here, choosing a spot where there was the most grass, we rested and lunched. The grass, however, was not plentiful, the greater part being what is called kinder-grass (sheep's grass), or a mixture of straggling birch and salix intermixed with coarse grass and herbage. The sheep eat this with avidity, but horses must be

very hungry before they will feed upon it. As we were about to depart a heavy snowstorm burst upon us. My guide had no waterproof, but I had a large oilskin that Mr. Kent, one of the sulphur explorers, had given to Paul; we therefore took shelter under the lee of a crag in the ancient lava stream underlying the grass-land, and improvised a roof with the oilskin and our whips. We were imprisoned for more than an hour; so violent was the storm that it was impossible to see many yards around us. Eventually it cleared up; we had almost succeeded in keeping ourselves dry, and I think our drenched and shivering horses were only too glad to resume their journey.

It was getting on towards night; the wind was blowing from the north-west, making our soaked saddles anything but pleasant, for so suddenly had the storm come on that we had not time to unsaddle our horses. We next followed the lava stream for some distance until we sighted the yellow depression which marked the commencment of the sulphur mines. As we decided that it would be more pleasant to travel on foot, and that by doing so we could make better progress, we fastened our horses each with his head tied to the tail of his companion, and steered for the light yellow patches, from which a few wreaths of steam were curling.

A short climb brought us to the most regularly-formed crater I have seen in Iceland. This was an oval depression, with a circumference of about half-a-mile and nearly 150 feet deep, called the "Great Kettle;" it was formed of a scoriaceous basaltic lava. No lava stream had actually flowed from this crater, but it seemed as if it had been tapped by a fissure some distance westward, whence a great quantity of lava had flowed, although all traces of such fissure or opening were now obscured by lava. The principal sulphur mines are upon the north and east side of the mountain, extending upon the latter right away up to the edge of the crater, and breaking out even within the crater itself upon its eastern side. I followed in the track of the exploring party, as I had done at Hlíðar-Námur, and dug into several parts of the solfataras. The sulphur here, as at the above-named place, rests upon a bed of calcareo-siliceous clay, and is strewed in many places with pieces of gypsum and fragments of lava coated with various sublimations; in some parts I found the pure sulphur to be upwards of two feet in thickness, the average thickness being, perhaps, half-a-foot. These deposits are much more extensive than those of Reykjahlíð, and I believe I did not inspect the whole of them. Returning to the summit, the extensive view was anything but a cheering one. To

the east lay the Mývatns Orœfí, with its black patches of new lava, the thin vapour which was rising from it making it dim and indistinct; further to the south we looked across the Trölladýngjur to Herðubreið, whose snowy cone was alone brightened by the sunlight, which had long forsaken the dark, shadowy waste of the Ódáðahraun; due south were the Dýngjufjall mountains, and upon them the night clouds were brooding heavily. A strong wind was raising great clouds of dust upon the plain which lay to the east between us and the Jökulsá. A fresh storm was rapidly shutting out the twilight in the west, and an ominous gloom had settled upon the rocks around us. A hunt after our horses in a blinding storm would have been anything but pleasant in such an inhospitable region, so we returned with all haste to our poor trembling steeds. Then with our clothes stiffly frozen, and our saddles covered with ice, all night long we rode in the face of a blinding storm, at a snail's pace, on account of the darkness.

By two A.M. we arrived at the foot of Bláfjall. The snow had turned into rain, and amid a thick woolly fog we made our way over the lava stream which lay between us and Grœnavatn. Our pace was of necessity very slow, and it was not until four A.M. that we reached the farm. Here we found

materials for a hearty meal spread out for us by the good folks, who had long since retired to bed. After doing justice to the catering of our unconscious hosts, I posted up my diary and turned in. On awaking again next morning I took a swim in the lake, and breakfast preparatory to my departure with Paul for Húsavík, where I hoped to have the pleasure of falling in with the exploring party. Passing to the south of the Lake of Mývatn, we crossed the Laxá (salmon river), which takes its name from the abundance of salmon found in the more northerly portion of its waters, and considerable time was here taken up in drinking coffee with an old friend.

The river Laxá, I may here remark, rises in the west end of the lake, and after flowing out a short distance is joined by the Kráká. From Mývatn Lake to Grenjaðastaðir (which may be called the upper portion of the river) its waters abound with trout and char, but at that point a waterfall (the Bruarfoss) prevents the salmon ascending the river any further. From the Brúarfoss to the sea there is, however, some of the finest salmon and trout fishing in Iceland, as many an English sportsman can testify. The Laxá, I found, emptied itself into the sea at the Skjálfandifjörð, not very far from the store at Húsavík.

Crossing the Mývatns Sandr, the road lies through

an undulating grazing country, and upon the high ground to the south of the little Lake of Laugarvatn we caught sight simultaneously of the steam from the hot springs of Reykir, to the north-east the Arctic ocean, which washes the northern shore of Iceland, and the mountains of Theistar-reykir, where a third series of sulphur mines is located.

On, on we sped, as fast as our horses could carry us, as the English steamer, for anything we knew, might be on the point of starting. The Mýrarkvísl, however, was reached in good time, and as I had stopped behind to give my horse a drink, leaving Paul to go on before me, upon crossing the river I was pleased to find him in conversation with Mr. Kent, who had been fishing. Great was my joy, too, on finding that the steamer had not gone, and that the exploring party was still at Húsavík. Soon after we proceeded to the farm of Laxámyri, which was the best farm I had seen in the country, and must have cost a great sum for an Icelander, as it was built by Danish workmen, with a wooden carving of a salmon and an eider duck over the front door to indicate the sources of the owner's wealth. Here I made a good meal, and after half-an-hour's nap we were off again, in company with Mr. Kent, for Húsavík, where I met with a most hospitable reception from the members of the Sulphur Pros-

pecting Expedition, and Herra Guðmundson, the merchant.

The sulphur party, I found, were submitting to an enforced stay, for their steamer was a week behind the time she was expected to arrive. They were all lodged in the house of the sheriff, which happened to be vacant, and a merry time they were having, especially the sporting portion of their community, who, I have no doubt, for a long time will sing the praises of Laxá.

Besides the veteran traveller Capt. Burton, there was another member of the party known to fame, Mr. Baldwin, a companion of the late Dr. Livingstone in his travels in Central Africa, whose "Twelve Years of Sporting Experience in South Africa" presents a series of vivid pictures of sporting travel.

Húsavík is pleasantly situated at the foot of Húsavík-urfjall, upon the eastern side of the bay of Skjálfandi, and has a good harbour except when the wind is blowing from the north. The mountains of Víkna-fjöll upon the western side of the bay form a great addition to the scenery; they were covered with snow even at this season of the year.

Having so long followed in the wake of the exploring party, it was impossible for me not to speculate upon the prospects of "the North Iceland Sulphur Company," and my lucubrations ran in the

following strain :—There is certainly no lack of sulphur both at Hlíðar-Námur and at Fremri-Námur, and the report of the *prospectors* on the smaller solfataras of *Theistareykir-Námur* is a good one. The road between the sulphur mines and the sea is not of such an impracticable nature but that it would be quite possible to construct a road, or to sledge the sulphur down in the winter. If the company set about their work in the right way and keep their undertaking in the hands of some half-dozen capitalists, they will probably not only enrich themselves, but also add another valuable export to needy Iceland. If, however, the shares are sent into the Stock Exchange, the chances are the undertaking will be weighted with too much capital, and thus be at the mercy of cliques of speculators belonging to that body.

After spending a night with the travellers, whose hospitality and agreeable society added greatly to the pleasure of my stay at Húsavík, the merchant, Herra Guðmundson, invited me to stay with him, and, as I needed rest, I accepted his kind invitation.

Nothing could exceed the kindness of my host, and I do not know how the sulphur expedition would have fared had it not been for his kindness and assistance. I was beyond measure sorry, on my return to England, to see a long article in a Scotch newspaper, from one member or some members of the party, disparaging

almost everything at Húsavík, and making invidious remarks about the wine which Herra Guðmundson had supplied us with from his own cellar, and which we had all partaken of with him at his house. Several members of the expedition whom I have since had the pleasure of meeting agree with me that it is a matter to be thoroughly ashamed of. After a few days' rest I left Húsavík to visit the remarkable cliffs of Ásberg, which Herra Guðmundson had informed me were equal to those of Thingvalla: his sister and nephew joined me, so that, with Paul, we made up quite a pleasant little party. Unfortunately, however, none of the other visitors were able to go with us, for they were afraid the steam ship might arrive, and not be able to wait their return. The road we took to Ásberg lay across a monotonous stretch of country (the Reykjahlið), which for the greater part of the way was undulating high ground, covered with ancient lava, partly grown over with dwarf straggling birch and herbage. The track which leads across it is called Bláskógavegr, or the way of the Blue forest. Bláberrie bushes are apparently the largest trees one meets with here; they, however, were rather abundant, and in some instances grew almost to the height of the long straggling apologies for birch brush which were occasionally to be met with. If it had not been that we were a

merry party, I should have felt the journey decidedly dull; but it was not, and ultimately we arrived at the small farm of Ás about midnight, a short distance to the west of the river Jökulsá, where we took coffee, bought a lamb, and, accompanied by the farmer, proceeded at sunrise to the cliffs of Ásberg. We found Ásberg to consist of a V-shaped valley some 300 feet deep, surrounded by perpendicular walls of basaltic lava to the east and west, while it opened out towards the north, insoculating an elongated cliff of basaltic lava, like a rocky island, towards the northern and widest part of the valley. This glen is a little more than a Danish mile in circumference, occurring towards the termination of an ancient lava stream, supposed by Capt. Burton and the geologist who accompanied his expedition to have been the work of pre-historic oceans, and that the walls of the valley are old sea cliffs—probably they are right.

The valley contains the finest wood I have seen in the island, consisting of a thick growth of birch and willow, in many places attaining to the height of thirty or forty feet.

Our guides informed us that in the spring time large streams flowed over the cliffs at the south end of the valley, forming magnificent cascades; and we noticed that in three places they had worn water-

courses for themselves, over which there now trickled only a feeble stream. There were also two deep pits filled with water, that appeared to have been hollowed out by the waterfalls which in the spring empty themselves into them. It was a beautiful day, and the fragrant birch reminded me of many a glorious ramble in North West America. Here we bivouacked, and cooked our lamb to a turn, under the supervision of our lady friend, and after enjoying the meal we shouted ourselves almost hoarse in awakening the echoes which probably had slumbered for years in the old grey cliffs, so it was not until ten in the evening that we started on our homeward journey. Right well and bravely did our lady ride, in spite of the fatigue which she had undergone, over rough ground and smooth.

We stayed at a small farm called Geîtar Staðir (goats' farm) for coffee and a drink of goat's milk, and arrived at Húsavík at 6 A.M. The exploring party we found, with the exception of Mr. Tennant and Mr. Baldwin, were about to start for the Dettifoss, intending to take Ásberg in the way; so I passed a convivial evening with my host, but was not sorry to turn in rather early. I was, however, soon awakened abruptly by two voices which seemed familiar enough, calling me to get up again. My early visitors proved to be Mr. Slimond and Mr.

Wight, of Leith, whose acquaintance I had the pleasure of making in the previous spring, giving me warning that the steamer Buda had arrived and was lying in Húsavík bay. On hearing that, I hastily dressed, and having given orders to Paul to take the best horses and start forthwith, bearing a note to Capt. Burton and his party, with the letters which had arrived for them, I proceeded with all haste to the Buda, to ask my newly-arrived friends to breakfast with me.

Upon nearing the ship, Mr. Slimond called out that they were just off to Borðeyri, and asked if I would join them. The steps were just about to be hauled up the ship's side, but I accepted his offer, and in five minutes we were steaming out of the Bay of Skjálfandi and sitting down to a genuine English breakfast. After rounding the island of Flatey, which lies at the mouth of the Skjálfandi, we obtained a beautiful view of the mountainous coast of the north of the island. The weather was delightful, and the pleasant society of old acquaintances, with the interesting occupation of looking through the latest news from England, made the twenty-four hours pass with amazing rapidity; so in fact I felt quite sorry when the next morning found us steaming up the Húnaflói, upon the S.W. extremity of which Borðeyri is situated. Here Capt. Cockle,

whose acquaintance I had previously made, had been waiting a whole fortnight with some 300 Icelandic ponies, the delay having been occasioned by the break-down of the engine of the Fifeshire, which Mr. Slimond had first chartered for his Icelandic trip. Mr. Slimond, I must explain, entirely commands the Icelandic horse trade, and has done more towards developing that branch of commerce in Iceland than any other man. During the time he has been in connexion with it, it is stated that he has spent over £50,000 in the country. This amount has wonderfully helped many of the Icelanders to improve their dwellings, and it cannot fail to have exercised a very beneficial influence in stimulating Icelandic trade as well as assisting the development of other branches of industry.

The horses were at last all penned into a karal, and by the time the Buda was fairly anchored in the Húnaflói, the obstreporous cargo was ready for shipment—a rather difficult matter, for the horses had to be conveyed to the ship in small boats, and as their respective ages varied from two to five years, as may be expected, the trouble of getting them all conveyed to the ship, hoisted on board, and stowed away can scarcely be described. While the process of loading was going on I took a walk on shore, in the company of Mrs. Slimond, her sister, and Mr. Wight, and I

must say we neither of us received a very favourable impression either of the place or the people.

Borðeyri itself is uninteresting in the extreme, as most of the more fertile parts of Iceland are; it is neither barren enough to exhibit the desolate grandeur of many other portions of the island through which I had travelled during the two previous months, nor fertile enough to be pleasant to the eye. By dint of great labour on the part of Mr. Slimond, Captain Cockle, and some of the ship's crew, together with the tardy assistance of some of the inhabitants of the place, the animals were at length stowed away, the Buda steamed out of the Húnaflói, and we arrived at Húsavík the following morning. Here the Sulphur Company came on board with all their belongings; Mr. Locke, however, remained, as he had some further business to transact at Húsavík and Reykjavík; so I took leave of Mr. Slimond and his party with many thanks for his hospitality, and, having shaken hands with the other members of the company, we parted with mutual good wishes for our respective journeys.

Accompanied by Mr. Locke, I climbed into the little boat that was waiting for us, and returned to our kind host, Herra Guðmundson, while the good ship Buda sped on her way to Scotland. Mr. Locke,

Herra Guðmundson, and his sister were bound for Reykjavík, but I intended to cross the Sprengrtandr, and pay a visit to the Skaptar Jökull. We therefore agreed to journey part of the way together, and I was easily persuaded to accompany them as far as Akreyri, as I wished to see the place—town it can scarcely be called—of second importance in Iceland. The next day, therefore, Mr. Locke, Herra Gudmundson, his wife, his sister, his little son, and a servant, Paul, Olgi, and myself, all set out first for Mývatn, where I inspected the solfatara I had cleared of its sulphur about three weeks before, and found it had quite a yellow tinge, although there was no appreciable fresh deposit of sulphur. From Mývatn we advanced towards Akreyri, and crossing the river Skjálfandifljót (quivering flood), we turned to the N.W., to view the waterfall of Godafoss. This waterfall is but a tame affair after Dettifoss, and the fall is about thirty-five feet; but the Skjalfandi is a much smaller river than the Jökulsá. There is, however, a finer waterfall higher up, upon the Skjálfandifljót, a distance of about a day-and-a-half's journey. We halted at the farm of Ljósavatn, and next day took the road past the Lake of Ljósavatn (Lake of Light) for Arkeyri, but at the lake Mrs. Guðmundson, her son, and servant left us, and we rode briskly on, up the pass of

Ljósavatnskarð. In clear weather this must be a beautiful pass, but the clouds were hanging so low upon the hills they obscured the view, and deprived us of what otherwise would, no doubt, have been a grand prospect. We soon reached the church and parsonage of Háls, and thence descended into a valley, Fnjóskádalr, in which there is the finest growth of birch, next to that in the valley of Ásberg, which had as yet come under my notice. We next crossed the river of Fnjóská, and forthwith commenced to ascend the heights of Vaðlaheiði, a mountainous ridge upon the opposite side of the Eyjafjörð to Akreyri. The summit of these heights was so enveloped in mist that all hope of benefitting by the view which such an altitude, viz. 2,118 feet, must of necessity command, was quite out of the question, we therefore descended straight away to Akreyri, which we reached by fording the mouth of the Eyjafjarðará, which can only be done at low tide. Here we put up at the inn, where several friends soon made their appearance, and a jolly time we had of it.

Although Akreyri is not so extensive a settlement as Reykjavík, it possesses a much better harbour, being shut in upon the east by the Vaðlaheiði, and upon the west by the hills of Súlur and the outlying mountains of the Vindheima Jökull, which

rise in some places to the height of 3000 feet. The town is situated at the south end of the Eyjafjörð (island firth), taking its name from the little island of Hrísey which lies in its mouth. The trade of this small place does not equal that of its sister settlement, owing, perhaps, to the numerous stores situated in various fjords in the north of Iceland, whereas Reykjavík and Eyrarbakki command the trade of the greater part of the south, in consequence of the iron-bound nature of its coast. Arkeyri is composed of two streets of wooden frame-houses, one of which runs so close to the sea shore as to be occasionally flooded, and it has a renown of its own, from the largest trees in the whole island growing there. These however, are merely two or three mountain-ash trees, about 25 to 30 feet in height, flourishing in front of a house facing the fjord, belonging to one of the principal store keepers!

The luxuriance of their growth is the more remarkable, as all the attempts which have hitherto been made to grow trees in Reykjavík have failed, although its mean temperature is much higher than that of Akreyri. The explanation of this probably is that Akreyri is one of the most sheltered spots in the island, while Reykjavík is exposed to the full fury of the east and west winds.

A short distance to the north of the town we found a cluster of black sheds, the filthy smell from which informed us at once of the odoriferous business carried on there, which was at full swing. I had often smelt from afar this same disgusting effluvium, and found it to arise from the profitable but revolting work of extracting oil from sharks' livers. Accompanied by Paul, I determined to inspect this manufacture, so, passing through an avenue of vats full of sharks' putrid livers, reeking and sweltering in the sun, we thrust our pocket-handkerchiefs into our mouths and plunged into the boiling-house. Here about half-a-dozen cauldrons of sharks' livers were simmering, and slowly "frying out" the filthy but valuable shark-oil, exhaling the foulest stench imaginable. Three grimy oleaginous men and a boy, who seemed to thrive amid their abominable surroundings, were engaged in stoking the fires, stirring up the stewing livers and baling out the oil, as it accumulated, into a long trough, which discharged itself into a large iron tank outside, whence it was drawn off again into barrels ready for shipment to the various parts of the world where there is a demand for such a very unpleasant lubricator. The men seemed quite surprised that we found anything disagreeable in the smell of the oil, and seemed quite to enjoy giving the cauldrons

an extra stir on our account, which was a pleasure we could have dispensed with.

In the evening we paid a visit to the apothecary, whose house seemed to be the rendezvous of all the captains whose ships were lying in the harbour, and there we arranged to depart the next day.

Here I may as well observe there are two ways from the north to the south of Iceland, the shortest being, however, the most difficult road, which lies across the Sprengisandr, and the longest, but easiest, across the Stórisandr. Mr. Locke, with Herra Guðmundson and his sister, had resolved to go by the Stórisandr to Reykjavík, and I wished to go by the Sprengisandr to the east, so that I might visit the Skaptar Jökull. Although I intended to have left early, it was night before we got away from Akreyri, for leave-taking always occupies an indefinite time in inverse proportion to the size of the place. Re-crossing Vaðlaheiði, we reached Ljósavatn (where I had left my baggage and baggage-horses) with the daylight, from whence we proceeded along the Skjálfandifljót to Stóruvellir. The river Skjálfandifljót runs down a broad fertile valley shut in by hills of basalt, which rise in some places as much as 1300 feet above the level of the river. From thence a broad stretch of grass-land, extending some 25 miles long, brought us to Stóru-

vellir, a flourishing farm surrounded by grass-lands. The people, we found, were all busy hay-making; so I ascended the hills behind the farm to look at the surrounding country, but before I could reach the summit it had clouded over, and I could see but a very short distance. Early next morning a man brought word that a fresh eruption had broken out in the Mývatns Örœfi. This was news indeed, and as it was Sunday, when some of the more distant population would be assembled at the neighbouring church, I despatched Paul to ascertain from them the accuracy of the news. In the meanwhile, however, accompanied by the farmer's son, I ascended the hills to reconnoitre, and when about half-way up I espied a tall dense column of white smoke in the east, which announced the correctness of the intelligence we had received. On arriving at the summit I looked again, and then perceived six smaller columns in a line with the larger one, rising to about half its height. These columns of smoke had evidently originated in the Mývatns Örœfi, and rose in perpendicular columns, which spread out at the apex like phantoms of giant palm trees in the calm atmosphere of that early autumn Sabbath morning! The position I occupied commanded a magnificent view of the Dýngjufjöll mountains and the Kverkfjöll, both of which volcanoes lie south of the

Mývatns Örœfí; neither of these, however, seemed to be particularly disturbed, but the mushroom-shaped cloud of smoke which had been there all the summer still hovered over the Dýngjufjöll. There appeared, however, no increase in the three thin columns of vapour I had before observed rising from the Kverkfjöll. Looking in another direction I found the country to the east obscured by what seemed to be a fog, which was, probably, vapour and ashes from the fresh eruption drifting slowly towards the Vatna Jökull. Presently the large volume of smoke from the Mývatns Orœfí disappeared, leaving in its place a cloud of thin black vapour, but before many seconds had elapsed it again sprang up in three distinct bursts to more than its former height. Hastily descending, I ordered the horses to be saddled, and at once we rode away at full gallop towards the seat of the new eruption.

By evening we reached the farm of Grœnavatn, where I had the pleasure of again seeing Thorlákur and his brother-in-law, and I forthwith made preparations for visiting the point of volcanic activity the following morning, but my plans were frustrated by a violent storm of rain, wind, and snow, which made it a matter of impossibility to cross the hills; so, chafing at the delay, I was compelled to postpone my expedition. During the previous night a man

had arrived from Grímstaðir, upon the eastern side of the Mývatns Örœfí, and reported that between ten and eleven o'clock on Sunday morning, August 15th, a smart shock of earthquake was felt at that place, travelling from north-east to south-west, while almost simultaneously columns of smoke were seen upon the plain of Mývatns Örœfí, and forthwith an eruption commenced from the same place as in the previous spring. Upon the 17th the storm had sufficiently abated, so, accompanied by Jón, who had been my guide to Fremri-Námur, I set out for the eruption. Upon entering a valley in the mountains of Mývatn, by which we intended to gain access to the Mývatns Örœfí, a few columns of smoke in the distance warned us that the eruption lay before us, and as we emerged from the glen, a line of some twenty columns of smoke burst upon our view, while at the north end lay two clusters of black mounds in close proximity. From the most southerly of these sprung up two columns of dense black smoke, which struggling to ascend, were beaten back to earth again by the wind in a foul heavy mist that spread itself out for miles over the lava streams, both old and new, which lay to eastward, clinging to the higher crags in dark, ominous-looking masses, and obscuring large patches of the more level plain. From its neighbour to the

north a high column of stones, ashes, and dust proclaimed the principal volcanic vent, and as we gazed upon the scene, suddenly, with a roar, every particle seemed on fire, while explosion after explosion hurled the larger fragments to a height beyond our view in the dense canopy of vapour which hung over us, making the ground upon which we stood and the rocks around us tremble. While the lava sloped over the most northerly side, the large column of fire sank, and only stones and cinders were ejected. This column of *débris* I noticed continually varied both in size and volume, sometimes clustering like a large swarm of bees in the smoke, apparently scarcely a hundred feet above the crater, while at other times it shot up into a tall column with explosive violence, the masses of scoriæ shrieking in their passage through the air. This was followed by a calm, and then again by a rending sound, as a new crater opened on the north side of the mound, which ejected a stream of white hot lava that tumbled in a cascade of fiery froth upon the old lava stream of the previous spring. At this point a dense smoke and the sound of splitting rocks marked its progress till it oozed in bright red viscous masses through the interstices of the older lava, forming pools beyond the limit of the elder stream, which glowed for a moment only and then turned black. As we looked on these

wonderful changes of the face of nature, a dim twilight supervened, although only six p.m., so we stopped upon a patch of wild oats which grew profusely upon many parts of these sands, and here we left our horses to feed while we took our evening meal upon a sand-bank commanding a full view of the eruption, which was rather more than a mile away. The scene was grand, but our horses did not appear to be particularly frightened at the eruption, for after standing some time looking at it, they quietly went on grazing.

On approaching the volcano as closely as the heated lava would allow, I found it to consist of a cluster of black mounds, describing together an irregular cone, from the centre of which, and probably towards the termination of the spring-eruption, a large crater had been formed, apparently little more than half-a-mile in circumference; its northern wall had now evidently been broken down, while from the centre rose the conical walls of the crater then erupting. There was a breach also in the north side, from which the lava poured at intervals, while numerous cracks in the walls of the cone caused the glow from the intense burning within to shine through with such brilliancy as to give the summit the appearance of being wrapped in flames. As I intently examined this,

two smaller craters became suddenly visible, one in the north base of the erupting mound and the other some little distance further north, in the lava itself. Both these were burning with a brilliant white light, and emitted a rending, crushing sound, although erupting with little violence. From these two craters the principal lava streams were advancing with considerable rapidity, encircling from time to time patches of ancient lava and sand which formed the plain, and finally overwhelming them in its fiery embrace. As night closed in, the heated lava and the noxious gases arising from it prevented me from getting nearer than within a few hundred yards of the volcano, so I lit my pipe at the nearest lava *coulée* and returned to camp. There again, while sitting by my tent, upon a high bank of volcanic sand, I gazed for a long time upon the mighty fountains of volcanic fire, which in one continuous stream assailed the sky with a glorious display of natural pyrotechnics. All through the dark hours of the night the volcano burned and roared, followed by explosion after explosion, which shook the desolate waste around to its very foundation. When I rose at midnight to take another look at this grand and terrible spectacle, it was still energetically erupting with a grandeur the equal of which I may never have another opportunity of witnessing; for the grim sands and lava fields of the Mývatns Örœfí

were bathed in an unwonted light which reddened the lurid sky and deepened the shadows amongst the weird crags of lava, rendering them still more unearthly in that fire-blasted wilderness in the midst of which we were encamped. The wind still blew freely from the north-west, from which quarter, fortunately, it had been blowing all the evening, so that I was enabled to reach a neck of land almost encircled with lava within about two hundred yards of the crater which was erupting. From this coign *d'avantage* I was able to examine minutely the progress of the eruption; but the heat was very great even at this distance, while my field glass shewed me that the fiery column seemed to be made up of myriads of molten atoms. The whole scene was, in fact, utterly indescribable, yet I could not but reflect how meagre and insignificant was even that glorious display in comparison with those mighty fires which have been occasionally let loose from such mountains as the Vatna and Skaptar Jökulls, and how terrible! how utterly unapproachable must have been their outburst! Yes, that is the unsatisfactory part about them; when they are in full working order there is no getting near them, and at other times one can only climb, shudder and freeze over their temporary tombs.

However, nothing daunted, at 6 a.m. I started to

examine the line of smoking mounds which marked the course of the great fissure or gjá (chasm). As mentioned before, this fissure was formed in the early spring, and re-opened on the 15th August, 1875, to give vent to the volcanic fires which have rifted and contorted the surrounding plain. The erupting mound had grown about 50 or 60 feet in the night, but the eruption itself, as I saw it, was evidently upon the wane. The next cluster of mounds towards the south contained three craters, but the largest was covered with whitish yellow sublimations, probably sulphur and sal-ammoniac. This was tranquilly steaming and had evidently not been disturbed during the recent outburst; in fact, all along the fissure there occurred mounds at intervals, and some were smoking violently, while many other smaller lateral cracks and fissures were likewise smoking, but not to the same extent. These fissures, I noticed, were entirely environed with hot lava, apparently of recent production, and a depression in some places of 50 feet in depth had sunk around them, varying from two to about four miles in breadth, while numerous deep chasms crevassed the adjacent plain. They were mostly parallel to the principal line of disturbance, and as they approached the depression they increased in size and depth, while those in close proximity to it ran into one another

where the ground was upheaved by a general chaotic dislocation. The whole line of smoking fissures appeared to me to have erupted lava both during the spring and at the eruption in August; the fissures terminated in a series of cracks, the edges of which were in many places covered with sublimations of sulphur and sal-ammoniac.

Aided by a strong north-westerly wind, which had fortunately been blowing throughout my visit to this remarkable spot, and a strong pair of leather boots, I succeeded at one point in traversing the still hot lava, till I reached the principal fissure about half-a-mile from its southern termination. In many places I found it was four or five feet wide, in some places choked with solid lava; and in others gaping widely open, but at some points it was spanned with cinders and lava, encrusted with various sublimations, which showed that there had been no recent outburst in that particular spot. In some places, however, similar accumulations had been scattered around by the recent disturbances, in fragments so variously encrusted that at first sight I was led to suppose the fissure had cast out great quantities of party-coloured cinders; at all events, at all points where the eruption had been particularly violent circles of cinders and clinkers had formed varying from one or two to many feet in height,

bridging over the fissure and forming conical mounds wherever the outburst had continued for any lengthened period. This struck me as being rather remarkable, as I should almost have expected to find the clinkers, etc., piled up in banks upon each side of the fissure, instead of assuming, as they did, such regular shapes, often at right-angles with the fissures producing them; but where the fissure was not blocked up it steamed violently, emitting nauseous smells and making hoarse choking sounds. Its depth I could not ascertain, as the emanations which arose from the lava I was standing upon compelled me to beat a hasty retreat, and indeed they made me feel dizzy for the remainder of the day. This gjá is situated in the Mývatns Örœfí, in a line parallel with Lake Mývatn, at the height of a little less than 1000 feet above sea level; its direction is N.N.E. to S.S.W. The length of the fissure is about twelve English miles, and from it has issued a lava stream of about fourteen English miles in length and perhaps three-and-a-half broad upon an average, though it is much narrower at some points than at others, especially towards its southern extremity. This recent lava, both of the spring and autumn, had flowed over the ancient lava and sand, rendering so large a portion of the Mývatns Örœfí a useless desert; while it had particularly overflowed an

ancient lava stream, produced by a vent in the west portion of the Mývatns Örœfi, called Svínagjá. The new lava appeared to differ from the old only in this respect, viz., that the ancient lava contained olivine, which the closest microscopic examination failed to discover in the more recent production. I also found that no pumice had been ejected from this fissure up to last August; lava, stones, cinders and ashes only having been thrown up. This spot may be regarded as the northern centre of recent volcanic activity, and the Öskjugjá as the southern, both occurring in the same rectilinear bearing, N.N.E. and S.S.W., and so coinciding with the great fissure which it has been presumed bisects the island from N.E. to S.W.

Carefully taking the bearings of the neighbouring mountains from the south end of the fissure, I made two or three dashes over the hot lava to look into the grim jaws of a chasm which had been erupting with especial violence, where the various heights of the conical mounds gauged the violence and the extent of the eruption; but a very short distance farther north the heated lava became too broad to permit of such excursions with any degree of safety, so I ascended some elevated ground to the west, in order to obtain a bird's-eye view of the seat of eruption.

This fissure, as I have before said, extends through a recently-formed depression, in the direction N.N.E. to S.S.W., extending from about one mile north of the road from Grímstaðir to Reykjahlið to a point bearing Jörundr 19° N., Búrfell 349° N.W. It had erupted in seven places with great violence, and had formed there conical hills, containing several craters. After inspecting these, I turned my back upon the line of steaming vents, having seen all that could be seen, and I was well contented with my little expedition. After a while we reached our horses by a short cut over the ancient lava, which had flowed partly from the Svínagjá and partly from the Mývatn hills, then returning to Grœnavatn, and proceeded thence to Stóruvellir the next day.

We left Stóruvellir amid a heavy gale and were accompanied by the farmer as far as Halldórstaðir, where the priest, who spoke a little English, would not hear of our leaving without partaking of coffee, chocolate, or schnapps. We took leave here of the bóndi of Stóruvellir, who had treated us hospitably and had charged very moderately.

Leaving here we next made our way to Mýri, where lived an old man whose father was the first to cross the Sprengisandr, in 1810, as the south of Iceland previously had been always reached by crossing the Stórisandr. This old man was pleased

to see me, and gladly gave me an account of the road, written by his father, to guide future travellers, and my informant I found was eighty-three years of age. Before leaving my new acquaintance I purchased a spoon of him said to be fifty years old. This was quite an ingenious novelty, for when unscrewed it divided into fifteen different pieces; I also bought a wooden roller which used to serve the purpose of a mangle a few centuries back, and a rude representation of the crucifixion in needlework upon green wadmal (Icelandic homespun cloth), which the old man told me had been worked by the nuns of an Icelandic convent long, long ago,—he could not say how long, but he knew that the banner was "eld gamalt" (very old). He also informed me that when he first went to Reykjavík for stock-fish no ships came to the north of Iceland, and that in Reykjavík coffee and sugar cost five marks (about 1*s.* 10½*d.*) per pound, while they could only obtain fifteen skillings (3½*d.*) per pound for their wool. The present price of these commodities, I may remark, is—coffee, three marks (1*s.* 1½*d.*), sugar, thirty-two to thirty-four skillings (6*d.* to 8*d.*) per pound—while they are now able to sell their wool at 1*s.* 1½*d.* per pound.

I sent Paul and Olgi on with the baggage while I, accompanied by the old man's son, went a

little out of the way to visit the waterfall of Alderjufoss, where the river Skjálfandifljót pours into a rift in an ancient lava stream, about forty-five feet deep. This sight is well worth going out of the way to see, as it is a much finer fall than the Godafoss.

The most remarkable feature about these falls, however, is the wall of rock over which they descend, the bottom of the wall being composed of perpendicular basaltic columns, overlaid by a compact basaltic lava of a very crystalline nature, while the columns themselves are of a compact stony basaltic lava, but in neither of the specimens I broke off could I find a single crystal. I am, however, inclined to think that both lavas are of identical composition, and of contemporaneous production.

Having satisfied my curiosity here I left the Alderjufoss behind, and rode quickly after Paul and Olgi, overtaking them not far from the lake of Ísholtsvatn, from whence a short ride brought us to the farm of Isholt, which was inhabited by a bachelor brother and his three sisters. Here we enjoyed a good supper of char and potatoes (for the latter were now of an edible size), and a good night's rest, preparatory to our journey across the Sprengisandr.

Although there are no fish in the Skjálfandifljót, there are plenty in Ísholtsvatn and the Fiskiá, which

flows out of it into the Skjálfandifljót. I suppose this is on account of the turbid nature of the water in the latter, which is purely a glacial stream.

After resting a while here I left Isholt in company with the farmer, and commenced our journey southwards, there being at the time a severe storm of wind from the N.W., bearing with it clouds of sand. On our way we paid a visit to the brother of the old man of Mýri, from whom I obtained some more curiosities in the shape of ancient spoons, one of which, like the other, could be separated into fifteen different pieces, and an old Prayer-book, printed at Hólar in 1742. This man lived at the farm of Mjófidalr (narrow valley) and had the reputation of being a good herb doctor. I found him pleased to see us, and before we left he treated us to a compound of schnapps and angelica root which was very refreshing. A fierce gale was blowing at the time from the S.W., and the sand was intolerable, even penetrating through the gauze of our snow spectacles, and almost blinding us; while at times the sand storm was so heavy that we were unable to see one another even when within touching distance. Our poor horses felt it very much, the eyes of some being completely closed up, so that when we reached to the grass hills to the north of Kiðagil, we were compelled to halt and bathe their eyes with water.

As the road here lay over a series of stony hills, grown over in many places with moss and scanty grass, the dust became less troublesome, and therefore we were glad to alight in the evening at the song-famed Kiðagil (goats' valley). The last grass to be found upon the north side of the Sprengisandr is in this valley, and it takes several hours' hard riding before the next grass is reached.

This valley is fertilized by the river Kiðagilsá which runs through it, and empties itself into the Skjálfandifljót at this spot. The weather cleared beautifully in the evening, so I climbed to the summit of Kiðagilshnukur, which commands an extensive view towards the snowy heights of Arnarfells, the Túngufells, and the white slopes of the Vatna Jökull, with their black cones and buttresses protruding through the snow. To the N.E. stretched the country to the north of the Vatna Jökull, with the well-remembered mountains which I had traversed with so much interest, and the desert plains over which I had trudged for many a weary hour, sore-footed and tired. The wind had sunk to rest with the sun, and the serrated outline of the Dýngjufjöll grew darker and darker, beneath the heavy canopy of smoke which still hovered over them, while the neighbouring mountains grew more in-

distinct and shadowy as the light faded from the west.

My tent had been pitched in the valley below, the autumn nights had now commenced, and the fitful gleam of the aurora told me my summer work was almost ended. On looking around upon those old familiar scenes—it might be for the last time—my emotion was so great that my tongue, in its endeavours to give audible expression to the sentiments that filled my breast, exclaimed with all the enthusiasm my nature was capable of, "Farewell, farewell, dear old Northernland! I came to your rugged and barren shores an enthusiastic traveller, anxious and resolved to seek out the wonderful things hidden in your frozen casket; and having enjoyed your simple and honest hospitalities and gratified my ambitious curiosity, I must now bid you adieu, bearing with me an affectionate remembrance of your craters and geysers, your mountains of eternal snow, and, above all, of the kind and faithful services rendered me by your hardy and generous sons and daughters."

Having relieved my emotion by this crude expression of my feelings, I took one more fond look and then turned in to rest for the night, feeling amid my regret at leaving old Iceland, something akin to an inward pride, to think that although so

humble a member of the Alpine Club, I had been enabled to accomplish so much, and that, too, notwithstanding the doubts of my friends, and the opinion of Mr. Forbes, who seems to have formed very erroneous notions as to the Vatna Jökull, or of the determination and endurance a member of the Alpine Club is capable of if once he sets his mind upon exploring a mountain.

To return to my narrative. Soon after day-break my men and I were again astir and in our saddles; but I was sorry to perceive that the weather had changed for the worst, which was a serious thing for us, seeing that we had a long, bad road before us, as well as a tiring journey to perform under various difficulties, enough to daunt the sturdiest of us. To add to our misery the clouds above were black as ravens' wings, and a fierce wind blew in such piercing gushes that we could scarcely stand against them, as they came bursting on straight into our very teeth. As I shuddered beneath the blast, I consoled myself with the thought that such a parting with Iceland was, after all, quite characteristic; and soon one poetic notion after another took such possession of me that by the time I had got thoroughly awake I began to find myself growing quite warm with excitement, and of course less sensible to the real severities of the storm. True to his kindly nature,

and well sustaining the character of his countrymen, my old friend the bóndi of Ísholt resolved to see me part of the way on my journey; and although unwilling to trouble him, I must certainly acknowledge the extreme pleasure this trifling act of courtesy and kindness afforded me. And when at last the hour arrived for us to separate, we shook each other heartily by the hand, and cheered ourselves in a parting cup which drained the last of my schnapps. "God speed" having been expressed on both sides, I resolutely turned my back upon the fascination of the distant mountains, and faced the driving storm of wind and sand to thread my way southward.

Our route at first lay over a series of low terraced hills, and presently a wet tedious ride brought us to a cluster of small stone cairns, round which were collected a number of horses' bones, not a very cheering sight to our own animals, and they seemed rather shy of the ghastly remains of their ill-fated brethren.

While looking on this sad sight, Paul told me it was often the custom to write a verse, and leave it in a bone upon such a mound as this for the next traveller, and, accordingly, I wished to do so too, but could not find one suitable, and so we felt ourselves relieved from the responsibility of keeping up the

"old custom." It would have been all the same, however, if we had desired to do so, for the cheerless prospect of fog and rain, with the apparently boundless Sprengisandr around us, varied only by an occasional glimpse of some snowy Jökull, would have been sufficient to freeze the most gushing of poetical ideas.

Wishing to quit this spot without delay, we determined upon taking the route known as the Arnarfellsvegr upon the west bank of the Thjórsá rather than follow the track upon the east, as by doing so we should be able to cross the numerous smaller rivers whose confluent waters form the Thjórsá, one by one, instead of having to wait perhaps a day or so, until the waters of the Thjórsá should be sufficiently low to enable us to ford them.

In the course of our journey we passed between Arnarfells Jökull and Tungufells Jökull, and thence bearing to the west, we got as close to the former as possible in order that we might cross these smaller arms at their source. Some of these arms, I imagine, must be very difficult in warm weather, for even upon this cold and stormy day they were in many places over our horses' girths.

Arnarfell, upon the N.E., rises from a band of glaciers, from which steep slopes of snow sweep up to the black peaks of Arnarfell-híð-Mikla, which

must be of considerable altitude, a little more than a Danish mile away from the termination of the glacier. The nature of the ground we were traversing precluded the possibility of quick riding, hence it took us five hours more to reach Arnarfell-hiǒ-Mikla, which was to be our destination for the night. This elevation is a cluster of eminences formed of agglomerate, which has been weathered into peaks of considerable height, and these are traversed by several dykes and intruded masses of basaltic lava. Here we found a good patch of grass and angelica, extending along the sides of Arnarfell-hiǒ-Mikla, as well as along the banks of the river washing its eastern base.

Our arrival at this part disturbed a bevy of swans, which at this season of the year (August) lose the feathers of their wings, of course preventing their flight. Taking advantage of this, chase was immediately given, and four of their number very soon captured.

I am glad to say the next morning showed us a more cheery prospect, for a stiff breeze blew from the N.W., and although the clouds hung upon the mountains, the sun occasionally broke through, encouraging us to put some of our wet things out to dry. While this was being done I ascended the Arnarfell-hiǒ-Mikla, and was well repaid for my

trouble, for the clouds were lifting from the adjacent mountains, which gave me a peep at the Vatna Jökull, as well as the more western hills, over the broad plain lying between it and the Arnarfells Jökull. The Sprengisandr is here cut up by a network of rivers and streams, which upon our side of the Sprengisandr all flowed into the Thjórsá. We now pursued our way with a bright sun shining upon us; the ground was in most places covered with swampy moss, which was much better travelling than the stones of the preceding day. Many streams with quicksands had to be crossed, whose waters were all the deeper for the fine weather we were enjoying. Turning thence directly southwards we struck the main stream of the Thjórsá. Travellers to the south who take the eastern route generally cross this stream at this point, but they are sometimes detained for days in consequence of freshets, which may occur at any season of the year; therefore the west side of the Thjórsá, though a little longer, is found to be much the surer road. Here we saw a number of sheep grazing upon the opposite bank, belonging to farmers in the south; and as may be well imagined, we hailed their appearance as the first sign of the "Suðurland" we were approaching.

After a short enjoyable halt here, we continued our

journey to a point between the rivers Kisá and Miklilœkr, where we encamped. On continuing our journey, an uninteresting ride over an undulating and gradually descending moor, which in fine weather commands a good view of Hecla, brought us to an ancient lava stream which had flowed from the Rauðu Kambar, an old volcano lying to the west of the road, and here again we found ourselves amongst lava, pumice and black sand.

I will not weary my readers any longer by continuing a description of the monotonous dreary scenery met with at this stage of my journey, and in fact as I trudged along dreamily, recalling to mind the many incidents that had crowded themselves upon me since I had been on the island, my eyes had been as it were blind to the surroundings to such an extent that more than once I was only recalled to them by the stumbling of my faithful horse, the rolling of a boulder, or an extra fierce gust of blinding wind; and then, once more reminded of the fact that I was still a traveller, I gazed around like a wanderer amongst the sepulchres of a past race, awe-struck with the lifeless condition of the place, while my mind wandered back from the silent scene to the one or two living giants (Oskjugjá, &c.) that still existed, lonely examples of the activity and power of an age so far re-

moved from the world's history as to be lost in antiquity, and yet still so vigorous as to fulfil the important and wonderful mission of connecting the present with the most primitive ages of the world.

Well, after trudging along several miles in this dreamy mood we at last arrived at the Skriðufell farm, but here, I regret to say, we found no welcome, for the farmer was a noted churl, and instead of offering us the same generous hospitality as all others had, he positively refused the smallest assistance, even going so far as to object to let us put our horses under the old roof of an outhouse. My companions pleaded in his behalf that he could not help it, as he had had the misfortune to be crossed in love! which I was very sorry to hear, and sincerely trust no similar calamity might happen to spoil the other inhabitants.

However, being compelled to push on again by this unpleasant contretemps, we made as much haste as we could, and were soon pleased to find ourselves in front of a poor little homestead, where we were glad to find a generous welcome, plenty of good milk and other necessaries, of which we availed ourselves, being made truly welcome. After this brief halt we again pushed on to the Hagafell along the banks of the Hagafjall, with Hekla full in sight, its summit being,

as usual, enveloped in clouds. Here we obtained a good night's rest, and wishing to obtain some specimens from the Great Geysir, I decided to reach Reykjavík *viá* Geysir and Thingvellir, although it was the longest route, and accordingly in the morning we made our way towards Hruni, upon the banks of the Kálfá. I next turned a little out of my way to examine a white buttress of rock protruding from a grassy hill upon our right hand. This proved to be a ridge of intruded trachytic lava, extending a considerable distance; I mention this as it was the only instance of purely trachytic lava which I had met with, excepting in a pumiceous form. Here we were most cordially and hospitably received by the priest of Hruni, who would not allow us to depart without bringing out a bottle of his best port wine, and hearing an account of our experience. It was late in the night before we arrived at Great Geysir. One of the principal objects of my visit to this part was to seek a box of minerals I had entrusted to the care of the farmer of Haukadalr to take to Reykjavík in the previous year, but which had never come to hand, though he protested that he had delivered them according to my directions, however, I set about collecting fresh specimens, which was no very serious trouble.

Great Geysir did not favour us with an eruption, as we had wished, so we stirred up Stroker with the usual meal of turf, which caused it to spout, but scarcely to the same height as when I witnessed its performance in 1874. In the evening we left for Thingvellir, but as we did not arrive there till one A.M. we did not awake our friend the priest, who, on rising, found us lying asleep, with the tent covered over us, upon the grass just outside his door. This good gentleman upbraided us for not waking him up, brought out everything of his best, and gave us a hearty breakfast, for we were old friends. Five hours' hard riding later on brought us to Reykjavík, where I again put up at the house of friend Oddr Gíslasson, who had two Scotch ladies staying with him. These I found to be Miss Oswald and Miss Menzies, who had been making a prolonged tour in the island—a plucky undertaking, which perhaps may encourage other ladies to seek health and amusement amongst the wild rocks of salubrious Iceland, undeterred by the fear of having no other escort than an Icelander.

Upon the arrival of the Post ship, I was amused to receive an extract from the "Evening Echo" of August giving a most deplorable account of my health and personal appearance after crossing the Vatna Jökull. Though it amused us all at Reykjavík, I felt

sorry to think of the unnecessary distress and anxiety it might cause to my friends at home. If such were the motive of the writer, it may gratify him to learn that he succeeded admirably. However, any one of the Sulphur Company would at once have pronounced the statement to be false.

I rejoiced in the possession of two pairs of Alpine boots, but I preferred wearing Icelandic mocassins, they being easier to walk in. I had also two coats, but always preferred wearing a tight knitted jersey and waistcoat, which were much more convenient for movement, while I generally prefer a knitted cap instead of a hat, for a cap draws down about the ears and keep them warm, and is less at the mercy of sudden gusts of wind. It seemed curious how such a worthless little piece of pure imagination could gain access to London newspapers. The simple facts are, I sent a carefully written letter, giving a succinct account of my journey across the Vatna Jökull and my visit to Öskjugjá, the effects of which volcano were creating much discussion in England at the time. This letter Capt. Burton kindly forwarded for me to the "Times," and it was set up in type (as the proof came into my hand on my return), but for some reason or another, best known to the editor, it subsided into the waste paper basket, while a more lengthy letter I afterwards wrote to the

same journal, giving an account of the eruption in the Mývatns Öræfi, appeared in full. There are anomalies in the civilized world which confound one even more than the idiosyncracies of nature.

With the Post ship came several tourists who were bent on making a few days' excursion in the island. We therefore made up a party, including Miss Oswald, Miss Menzies, Mr. Young, of Edinburgh, and myself, to pay a visit with Oddr Gíslasson to some solfataras belonging to him at Cape Reykjanes, and a very pleasant trip it was, though the way was extremely monotonous, being as usual over a series of lava streams flowing from the Krisuvik mountains. The part of the S.W. peninsular we were traversing was called the Vatnsleysuströnd, or waterless strand; here there is no fresh water to be obtained except upon the beach where the lava streams terminate. These can often only be reached at low water, and then, as may be imagined, the water is brackish. Two days' journeying brought us to Kirkjuvogr, where Oddr Gíslasson's mother and brothers-in-law lived. It is one of the best homesteads in the south, besides having about the largest piece of grass land on this peninsular. It is also a fishing station of some importance, lying as it does upon the south bank of a little boot-shaped creek named Oscar. We were very kindly received,

and the next day rode on to the solfataras of Reykjanes at the extremity of the peninsular. The day was miserable, and we were unable to get a satisfactory view. These solfataras, however, are remarkable, as the acid and heated vapours have here, as in other places, formed extensive pools of calcareo-siliceous mud, hardened in some instances into almost a semi-opal, coloured and streaked with blood-red stains from the ferruginous nature of the rocks which have been decomposed, but the sublimations of sulphur were very insignificant.

The most remarkable feature of the locality occurred where the lava was not much decomposed by the erosive action of the vapours, and upon splitting such masses of the partially decomposed rock, scarlet vapours could be seen issuing from crevices beneath, coating any surface that was partially exposed to the air with a film of iron pyrites. Further up the side of the old volcano, at the base of which these curiosities are to be found, are pools and pits of blue, red, and green boiling clay. While in this locality the rain continued and the fog became more dense, and as it would have been anything but pleasant to be caught in a thick fog amongst the lava and solfataras of Reykjanes, we curtailed our visit, and returned with all speed to Kirkjuvogr.

The next day, wishing to avoid the tedious road

over the lava by which we came, we rode to Njarðvík, where we hired a sailing boat, and returned by sea to Reykjavík. Here I found that Captain Cockle and Mr. Slimond had returned by the Post-ship with the welcome intelligence that the steamer "Queen" would arrive in about a week, and sail almost as soon as the old tub "Diana." This was indeed good news to us all, for we had determined to return by a small sailing ship belonging to a horse-trader, Mr. Ascham, rather than subject ourselves to the floating purgatory of the Diana.

In due time the "Queen" arrived, and I bade Iceland and Icelandic friends farewell, feeling satisfied with my summer's work, and consoling myself with the thought that I had accomplished the little piece of "utter folly" I had thrice undertaken. I resignedly committed myself to the evils of sea-sickness, from which I had scarcely recovered when we arrived at Edinburgh, two days before the Diana, which had sailed from Reykjavík a day before the Queen. Here I accepted the hospitality of Mr. Slimond, of Leith, and greatly enjoyed British fare and a relapse into civilization.

"Ah!" my reader may say with a smile, "after all the toil and trouble undertaken the wonders seen could not have been worth the toil and privation." My readers, like myself, must by this time have

grown somewhat weary of the eternal repetition of lava, pumice, &c., &c., and therefore we will mutually congratulate ourselves upon being able to vary the subject with reference to scenes and subjects more lively and civilized; but I must most respectfully demur to that conclusion, for if the general aspect of nature throughout Iceland be dreary and wild, there is also plenty to reward a man of scientific and athletic inclinations. Indeed the same tiresome pumice and lava and sand, when placed beneath the power of the microscope, is found to possess such wonders and exquisite beauty of form, that the beholder is struck with admiration and astonishment to find so much perfection treasured up in such rough settings, giving material for many an hour of patient study and enjoyment which has alone fully compensated for the hardships of the journey across the Vatna Jökull.

APPENDIX.

It may now be as well to take a retrospective view of Iceland to determine the opinion we have formed of the Icelanders themselves, and sum up the leading physical features and characteristics of the country. Iceland, apart from its historical and literary fame, which it is not our purpose to consider, is of especial interest to the geologist and the physical geographer. It lies almost at the northern extremity of the great volcanic line which skirts the extreme west of the Old World, extending from the island of Jan-Mayen in the Arctic Ocean, through Iceland, the Faroe Isles, Great Britain, the Madeiras, the Azores, the Canaries, along the west coast of Africa, right away down to the Antarctic island of Tristan d'Acunha; and its equal as a centre of volcanic activity can alone be found amongst the islands of the Pacific Ocean. The peculiar manner in which we here find ice and snow mixed up with the igneous productions of its volcanoes imparts a grim beauty to its scenery, that I can well imagine we might travel the whole world over without seeing surpassed. A very short sojourn amongst the weird rocks of

Iceland arouses that latent superstition which will lurk in the minds of even the most materialistic, and while we laugh at the mythological credulity of the ancient Icelanders, we cannot help acknowledging that a more fitting place to create an implicit belief in wraiths and demons could not possibly be found, all the way from the elf and pixy dancing amongst the timid flowers, whose bright eyes peep from sheltered rocks in ancient lava streams, to the hob-goblin and the ghoul, moaning and shrieking and performing their nameless deeds upon blasted peaks and barren mountain-tops, where fire strives with frost.

This remarkable little island was colonized 1002 years ago by Norwegians, though its earliest settlement is involved in some obscurity. It afterwards became subject to Denmark, until the year before last, when it received its legislative freedom. The Icelanders are upon the whole a harmless, struggling race, and like most other nations that have been unable to draw upon the arteries of other countries for renewed vitality, are encumbered with that contentment which, however conducive it may be to domestic ease, is fatal to advancement. The last twelve months, however, have introduced the element of enterprise which before was only conspicuous by its absence. This may result from their newly-

acquired liberties or the reflective influence of emigration; at any rate it augurs well for Iceland, whose emigrants have already shown that the Icelander contains a good deal of the right sort of stuff in his composition, and the determined pluck of those who accompanied me across the Vatna Jökull shows us that the spirit of their Viking forefathers, who visited both Greenland and America long before the birth of Columbus, is not yet extinct. Pre-eminently perhaps in the Icelanders' character stands love for his country. It is a remarkable fact that the more barren and unfruitful a country is, the stronger seems to be the attachment and love of the sons of its soil. This trait appears very strongly in the Icelanders' national song, the first stanza of which runs thus—

"World old Iceland, beloved fosterland,
As long as the ocean girds our shores,
As long as lovers for their sweethearts sigh,
As long as the sun shines upon our mountains,
Thy sons shall love thee."

There is great room for improvement in the home industries of the country, especially in the art of cheese-making, for the milk is rich and excellent, and there is no reason why cheese should not be produced in Iceland that would find a ready sale in European markets. The Icelandic wool, which is

unsurpassed, might be likewise worked at home during the winter to a much better advantage; for many choice woollen productions which would command a high price have long ceased to be manufactured. There is also room for improvement in the breeding of stock, and much valuable grass-land might be reclaimed by proper drainage.

The climate of Iceland is very uncertain, but it is much milder than might be expected from its latitude. This is doubtless owing to its insular position, and the influence of the Gulf Stream, one arm of which touches its southern shore. The summer begins in June and ends in September, and during those months the climate is very similar to that of the north of Scotland. The rainfall, especially in the south of Iceland, is very great during the summer, but thunderstorms seldom occur except in the winter. Upon the mountains the climate is still more variable, and I have sometimes experienced a variation of sixty degrees between day and night upon the snows of the Vatna Jökull, at the height of some 4,000 feet above sea level. But few vegetables can now be grown in Iceland—a modicum of potatoes, turnips, radishes, and cabbages alone eking out a struggling existence against an adverse climate, and seldom attaining to what we should consider maturity. The trees of Iceland are mere bushes of birch, willow,

and a little ash, and even these are but rarely met with. The chief exports of the country are fish, oil, tallow, wool, horses, sheep, and Iceland spar, but it is to be hoped (now the sulphur mines in the north of Iceland are about to be worked) that in the course of a year sulphur may be added to these. The imports are some of the luxuries and a good many of the necessaries of life. So much for Iceland itself; we will pass by its history, people, exports or imports, and forthwith consider its physical characteristics; these may be defined as the volcanoes of Iceland and their products, the hot springs, the Jökulls, or ice mountains, and their effects upon the climate. Iceland contains no less than twenty-two mountains that have been witnessed in active eruption during historical times. The best known volcano is Hekla. This remarkable mountain rises directly from a plain that has been devastated by its repeated eruptions. As the mountain is approached from the north-west its form appears to be that of an oblong cone; it is about twenty miles in circumference, and 5,000 feet in height; it is capped by three smaller cones, the product of recent eruptions. Its craters are all upon the west and south-west sides, and most of its lava streams have flowed in that direction.

The next best known of the Icelandic volcanoes is perhaps Kötlugiá, which has erupted no less than

fifteen times since the year 900. It now presents nothing but a deep valley filled with snow, cutting into the very heart of Myrdals Jökull; it is one of the largest examples of breached craters in the world. The principal phenomena attending eruptions of this volcano are stupendous floods of heated water and the prodigious quantities of sand ejected. It has, I believe, never been known to produce lava, but upon the base of the mountain I found numerous ancient lava streams, proving that at one time Kötlugiá was no exception to its neighbouring volcanoes. The floods from Kötlugiá during eruptions have often submerged a district of 280 square miles, continuing sometimes for days, in spite of the rapid outflow to the sea. These floods are produced not only by the melting of the snow at the time of eruption, but in all probability by the bursting of large cavities in and beneath the mountain, in which water might have been for years accumulating. This aqueous phenomenon is, however, by no means peculiar to Kötlugiá, although it occurs on the largest scale, for during the 13th and 14th centuries all the volcanoes in the south of Iceland erupted water. The most extensive eruption that ever occurred in Europe during historic times proceeded from the south-west portion of the Vatna, named the Skaptar Jökull. This volcano has only been

known to have erupted upon that occasion, viz., A.D. 1783, when it produced two of the most extensive lava streams in Europe. The highest volcano in Iceland is Örœfa Jökull, which reaches the height of 5927 feet.

The volcanoes which erupted so violently in the spring of 1875, and one of which wrought such damage in the north of Iceland, are—the Öskjugjá (or the chasm of the oval casket), situated in the Dýngjufjöll mountains upon the north of the Vatna, and a chasm some twelve miles in length, which opened in the Mývatns Örœfí (or sandy desert of Mývatns), but as these have already been described at some length I need only casually mention them.

Having briefly enumerated the more important volcanoes of Iceland, we will now consider their products. First there are the agglomerates, which form such an important feature in the geology of Iceland, formed either directly by debacles at periods of eruption, or indirectly by streams and atmospheric influences. Secondly we come to the lavas; these occur either as stony streams that have flowed from the volcanoes, or as pumice which has been hurled high into the air and fallen in a destructive shower of vesicular cinders. Another class of lavas we must likewise mention, namely, the glassy, but we

must for the present confine ourselves more particularly to the physical geology of Iceland, leaving the character of the Icelandic rocks for other consideration. Of the stony streams of lava we have two very good examples; first, the huge lava streams which flowed from Skaptar Jökull in 1783, being 50 miles long and 15 wide; and the other 40 miles in length and seven broad, being in some places 500 feet in depth. It has been computed that the entire mass exceeds in bulk that of Mont Blanc. This lava is basaltic and highly ferruginous, and impregnates very strongly the waters of the river Eldvatn, which flows through it. The second example is the lava stream which has flowed into the far-famed valley of Thingvellir, wherein the Althing, or Parliament, of Iceland used to hold their meetings, and the wonderful rifts of the Almanna-gjá and the Raven's-gjá occur. At some remote period of the geological history of Iceland a large river of lava flowed from Mount Skjaldbreiðr, which is about thirty miles distant, into the valley of Thingvellir; a crust, of course, soon formed on the surface, and upon the cessation of the eruption, the still liquid lava at the bottom of the stream continued to flow into the deeper parts of the lake which occupies the south-east end of the valley of Thingvellir, leaving the unsupported crust, which was now of great thickness, to sink down to

the present level of the valley, occasioning lateral rifts upon either side of the stream, viz., the Almannagjá on one side, and the Raven's rift upon the other. The valley of Thingvellir is likewise traversed by many smaller fissures and crevasses, which in many instances enclose and almost insoculate large masses of lava; the Lögberg, or "hill of laws," is such an island of rock, and is rendered inaccessible, except at one point, by deep yawning crevasses. It was on account of these natural fortifications that it was chosen as a forum for the ancient court of Althing, which assembled there once a year. Such are the monuments of Iceland, which take the place of the ruined castles and abbeys of other countries, simply the rude rocks of nature ennobled by brave deeds of history or some touching romance of love.

We now come to the hot springs of Iceland. The chief of these, *par excellence*, is, of course, the Great Geysir; it has been so often described and re-described that it scarcely needs a remark from me. Professor Forbes calculated its age, from the thickness of the siliceous sinter which surrounds its basin, at 1000 years. The Great Geysir is surrounded by numerous other springs of all temperatures and sizes, whose deposits differ according to the character of the rocks through which they pass. There are numerous hot springs scattered about in various

parts of Iceland, some of which owe their existence to earthquakes, which instantaneously called them into being—in 1339 a hot spring sixty feet in diameter suddenly opened at Mosfell—and during the earthquakes which preceded the great eruption of Skaptar Jökull in 1783, no less than thirty-five new hot springs made their appearance. We may not dwell longer upon these interesting phenomena, but we will turn our attention to the huge ice mountains or Jökulls of Iceland, which constitute such an important feature in the physical geography of the country. The principle ones are the Vatna, Arnarfells, Hofs, Lang, Myrdals, Godalands, Eyjafjalla, Dránga, and Glámu Jökulls. Of these remarkable features in the physical geography of Iceland we could not find a better example than the Vatna Jökull, which has formed the principal subject of this little book: until recently it was almost a *terra incognita*, and until this year had resisted all attempts to cross it.

The Vatna Jökull is a vast accumulation of volcanoes, ice, and snow, comprising an area of over 3000 square miles. It is for the most part surrounded by a wilderness, formed by the destructive outbursts of its volcanoes, and the constant drifting of the glacial torrents which flow from its melting snows. The Vatna Jökull and its immediate sur-

roundings constitute the most lofty portions of Iceland, and I believe the oldest, for we find lava streams which have flowed from its volcanoes in a state of ruin and decay unequalled in any other part of the country; and, again, we find it bounded upon the south by sea cliffs that were washed by prehistoric oceans when many other parts of the island must necessarily have been under water, unless very serious depressions have taken place since the waters which washed the south outlying hills of the Vatna receded to their present limit. The Vatna Jökull comprises by far the most important mountain section in Iceland, and a far greater area is covered by its snows than could be occupied by the sum of all the remaining snow-clad mountains in Iceland. As may be supposed, perhaps half the river water of Iceland flows either directly or indirectly from the Vatna Jökull, either issuing in torrents from the extremity of its glaciers, or, after filtering for long distances through the loose and cavernous ground, appearing as land springs at a lower elevation. The rocks of the Vatna, as far as I have had an opportunity of judging, are purely and simply the product of this very remarkable cluster of volcanoes, which have piled up layer after layer of ash, sand, and agglomerate, until a mountain heap was formed of such a height that it allowed snow and ice to accumulate upon it to such

an extent as to render the summer's warmth quite inadequate to remove it. This vast snow pile then grew of its own accord, and glaciers commenced to creep down the sides of the barren mountains upon which it rested. Volcanoes continued to erupt, but the effect of their fires upon the accumulating snow must have been purely local and limited in the extreme; for volcanic productions are the worst possible conductors of heat, and I should imagine that a lava stream, unless it be of gigantic proportions, conducts itself beneath the profound snows of the Vatna much as a lava stream would beneath the sea, without producing any very violent commotion. Thus this vast mountain mass was accumulated, growing with each succeeding winter and each eruption. The Vatna Jökull rises by a very gradual slope upon the south, and it is not until more than thirty miles of snow fields have been traversed that the highest part of the Vatna, viz., 6,150 feet, can be reached from that direction. I have at present omitted any mention of the snow line in Iceland; this is on account of its variable nature, incidental to local causes. Thus upon the Vatna we have the snow line much lower upon its southern than northern slopes, the cause of which we will consider presently. Of late years the volcanic forces of Iceland appear to have retreated to the

Vatna Jökull and its immediate neighbourhood, and volcanic eruptions have been witnessed in force in several directions. The Kverkfjall we found to be smoking and Öskjugjá can only be regarded as a lateral crater of the Vatna, and, I doubt not, had we been favoured with better weather, we should have found many other eruptive vents; but so rapid is the accumulation of snow upon the Vatna, and so bad a conductor of heat are all volcanic eruptions, that the traces of them are very soon obliterated. As may be supposed, such a prodigious accumulation of ice and snow as the Vatna Jökull produces a very sensible and marked effect upon the climate of certain parts of Iceland. It has this effect—it deluges the country to the south of it with rain, and gives to those districts which lie to the north of it a happier climate than they would otherwise possess. The snowy heights of the Vatna attract to themselves the aqueous vapours which travel northwards from more southern latitudes, depositing them upon their broad shoulders in the form of snow and hail, and refrigerating and drying the vapours which travel across their snows, thus rendering the south wind a wet one in the country to the south of the Vatna and the north wind a dry one, whilst in those districts which lie to the north of it the reverse is the case. And since by far the greater part of the aqueous

vapours which reach Iceland are borne thither from the more readily evaporating waters of southern oceans by that bugbear to travellers in the south of Iceland, the southerly wind, we see at once why the snow line is lower upon the south than the north of the Vatna Jökull. When we inspect the glaciers which fringe the south of the Vatna Jökull, we find they have decidedly advanced; indeed, at one point so much so as to almost destroy communication along that part of the south shore. Upon the north we find that a huge tongue of glacier has flowed down full ten or twelve miles beyond the utmost limit assigned to it by Gunlaugson some forty years ago, while the route traversed by that enterprising man is completely overrun by the ice, and the traditionary road of the Vatna Jökull's vergr is now amongst the high snows of the Vatna. Icelanders, as a rule, are loth to admit the advance of their glaciers, and vainly appeal to striated rocks at much lower altitudes than most of the Icelandic glaciers of the present day, and to moraines stranded upon the plains beneath some of the principal mountain sections; but since it is impossible to say when these rocks were scratched, or even whether the very rocks to whose striæ they so confidently point were not erupted long before Northern Europe and America disappeared beneath the ice and snow of the earlier glacial period, what

is the use of such evidence? The very moraines may have been produced by the glaciers which have strewn even our own country with erratic boulders and glacial *débris*. Again, it is no uncommon thing in Iceland for huge masses of glaciers to slide down the mountain side during periods of eruption, scratching the harder and furrowing the softer rocks in their progress, and leaving heaps of *débris* in no way distinguishable from terminal moraines. These facts are rather startling. True, the glaciers of Iceland may, and, no doubt, do ebb and flow, but they gain upon the whole, and never would increase to this extent was not the annual accumulation vastly in excess of the waste. It may be said this is due to a cycle of unpropitious seasons. Possibly; but we find this advance of northern glaciers is not peculiar to Iceland. Dr. Nordenskjöld has proved a considerable advance in the glaciers of Spitzbergen; Greenland gives us the same intelligence. This seems to point to something more than a local advance, compensated for by a retreat in other places. It is too rapid an advance to be accounted for by astronomical causes; but cannot we suggest some comparatively slight physical changes which may account for it? Granted that above a certain latitude the earth only receives as much heat during the summer as it does during the winter, and that in one

winter it will accumulate just as much snow and ice as the summer's heat will suffice to melt, if it were all employed for that purpose. Now we are perfectly aware that snow and ice having once accumulated, a greater part of the succeeding summer's heat would be reflected back into space and not employed in melting them, while the aqueous vapours condensing above it would screen the snow from solar influence. Thus a new glacial period would creep upon us, heralding its approach by an advance band of low temperature of its own production were it not for the warm oceanic and atmospheric currents, for the beneficial influence of which we have only to look at the varying temperature of many localities in similar latitudes to appreciate. A great alteration in temperature and climate would certainly take place supposing any variation should occur in the direction of these currents—in the Gulf Stream, for instance. Supposing that its waters, instead of reaching so far north, were deflected southwards, then not only would Arctic climates and Arctic ice be less affected by it, but the deflected stream would heighten the temperature of the waters of lower latitudes, and cause an increased evaporation; consequently there would be an increased condensation upon northern mountains and Polar shores, and an increased reflection of the succeeding summer's sun. It is rather

a curious fact that less American driftwood has been brought to the northern shores of Iceland during late years, and an increased amount has been cast upon its southern coast. This little fact of course proves nothing in itself; but when we see northern glaciers advancing to the extent they have done one naturally asks the reason. Astronomical causes we must put on one side, for the glacial advance is too rapid to admit of that solution. But if northern glaciers continue to advance, it will be a matter of some interest if we could ascertain whether those mysterious forces which give birth to the earthquake and the volcano have wrought any alteration in the flow of that guardian angel of the north—the Gulf Stream.

We will now pass on to the volcanic rocks of which Iceland is constituted. The foundation of Iceland is palagonitic tuff of sub-aqueous origin, disturbed and at times metamorphosed by enormous masses of amygdaloidal basaltic lava whose cavities abound with zeolites, being traversed by dykes and layers of interjected basaltic and trachytic lava at all times dislocated and confused by the various earthquakes which from time to time have shaken Iceland to its nethermost stone. These rocks are overlaid by lava streams of sub-ærial origin, pumiceous tuffs and agglomerates that have been

formed by debacles and atmospheric influences. Concerning the strike and dip of the various layers of trap and basalt there is no general inclination, no uniformity—all is confusion. The loose soil of Iceland is entirely composed of disintegrated and decomposed volcanic rocks and decayed vegetable matter, and would be very fruitful if it were in a lower latitude. The vast period of time which it must have taken to decompose the huge lava streams that we find almost entirely converted into humus may be appreciated when we look upon pre-historic lava fields, grey with lichens, like that of Thingvellir, while the actual decomposition of its surface scarcely amounts to half-an-inch. We may divide the lavas of Iceland, like those of most other volcanic districts, into two classes; first, the basalts passing into dolerites, and secondly, the trachytic lavas. The more ancient basalts occur most frequently as intruded masses of amygdaloidal character; the doleritic lavas of Iceland are the more recent products of its volcanoes, varying only in this respect, that the earlier erupted lavas contain crystals of olivine, in addition to the felspar and augite which occur in most of the lavas of our own time.

Trachytic lava occurs but sparingly in the parts of Iceland that I have visited. It has for a long time been assumed that a trachytic band was dis-

posed upon a fissure which bisected Iceland from N.E. to S.W., namely from Cape Langanes to Reykjanes upon which the principal centres of eruption were supposed to be situated. This, however, is a presumption unwarranted by investigation. A glance at the map will show us that there are many other centres of volcanic activity which do not occur in this imaginary trachytic band. True most of the more recently active volcanoes occur upon this rectilinear, but there are Myrdals Jökull, Eyjafjalla and Örœfá Jökull, all volcanoes that have erupted comparatively recently, and a host of more ancient volcanoes distributed over other portions of the island, which might lead us to surmise that there were a dozen instead of one great fissure in the superficial rocks of Iceland.

Trachytes, principally I believe in an altered condition, have been found around and between Hekla and the Geysers, and notably at the volcano of Rauðarkamb. I was informed, however, that we must look for the greater part of the trachyte of Iceland other than in a pumiceous form upon the peninsulars of Snæfells Jökull. Certainly I found that trachytic lava almost died out upon the north side of the Vatna Jökull, or else it is so covered up with recent volcanic productions as to be undiscernible. The obsidians of Iceland, which are found so universally

distributed in fragmentary forms upon the sides of the volcanoes are seldom to be met with *in situ*, indeed the only instance that I have met with of obsidian *in situ* was at Mount Paul, in the heart of the Vatna Jökull. That mountain, as we have already seen, is entirely composed of obsidian, varying from the vitreous to the grey stony variety.

The obsidians of Iceland seldom contain the beautiful felspar crystals, so characteristic of the Arran pitch-stones, but some of them are of a porphyritic nature, showing under the microscope crystals of quartz much fissured and split about, no doubt during the process of cooling. We must also regard the greater part of the pumice which was ejected last year from the Oskjagjá as an obsidian, in spite of its remarkably vesicular character. The fine dust which was carried to Norway during the eruption of last Easter-day resembled powdered glass, and led geologists there to come to the conclusion that the mountain which was erupting must have been pouring out great quantities of obsidian. As compared with the lavas of Vesuvius, I cannot help suggesting that many of the more ancient lavas in both instances are of a more trachytic and porphyritic character. In the Vesuvian lavas especially, the crystals contained by the older rocks have crystallized out of the uncrystalline or semi-crystalline

mass. A prevalent mineral in the older Vesuvian lavas is leucite, which corresponds to the olivine that occurs so frequently in the older erupted lavas of Iceland, while those minerals are seldom to be met with in the more recent lavas of either Iceland or Italy.

I must now bring these few pages to a close. I dare say they contain a great deal of what is not worth reading; but as they give the only account of the Vatna Jökull and the part of the Odáðahraun which I traversed, I trust those that may take the trouble to read them, will accept them as the best and the most accurate account of those districts that I am able to give.

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